ROHDE&SCHWARZ

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MÜNCHEN

Servicing Manual

VHF TEST RECEIVER HFV

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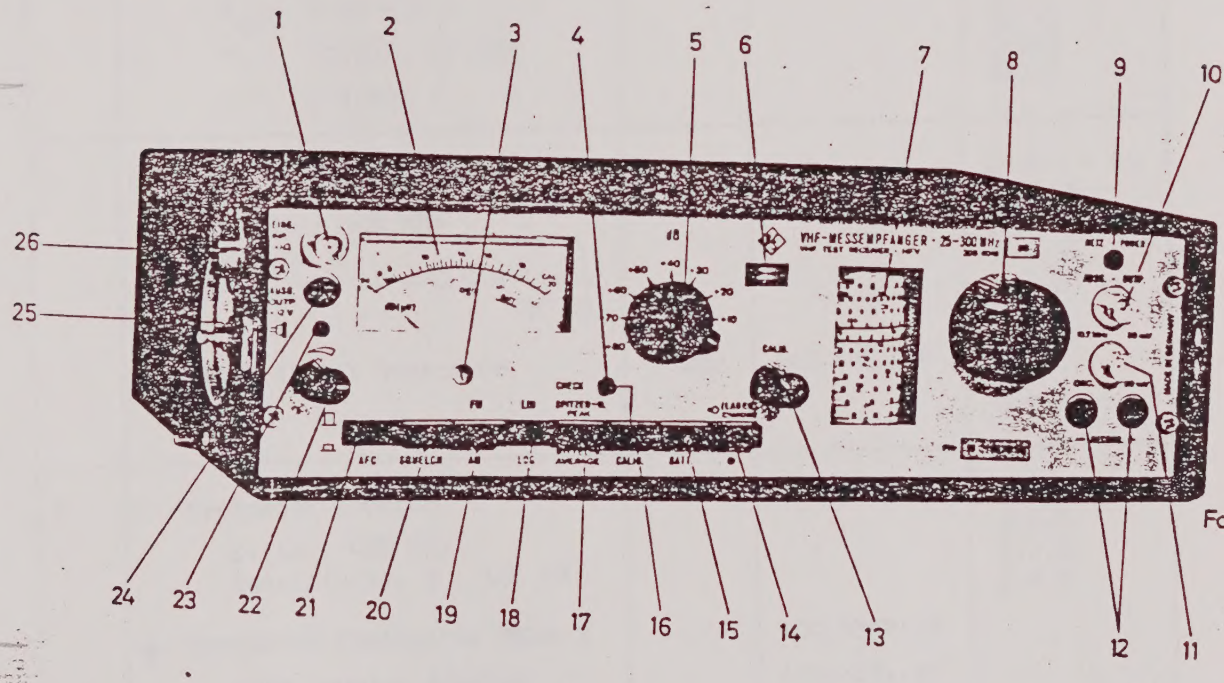

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Bedienungsbild zum VHF-Meßempfänger HFV 203.6018.05

3. Maintenance

3.1 Required Measuring Instruments and Accessories

No.	○ Instrument, required data ● Recommended R&S unit	Type	Order No.	Use in section
1	○ Multimeter V_{DC}: 0.1 V - 100 V I_{DC}: 1 mA - 1 A V_{AC}: 1 mV - 500 V I_{AC}: 1 mA - 1 A f: 10 Hz - 10 kHz Z: $\geq$ 1 MΩ			3.2.1 5.1.1 5.1.2 5.3.2 5.3.5 5.4.1 5.4.2 5.5.4 5.6.1
2	○ AM-FM signal generator f: 10 - 500 MHz Z = 50 Ω V_{out} = 1 µV - 0.5 V (into 50 Ω) ● AM-FM Signal Generator	SMDA	100.4559.04	3.2.3 - 10 3.2.15 5.3.1 - 8 5.4.3 5.4.5 5.5.1 5.5.2 5.5.5 5.6.4
3	○ Frequency counter f: 10 - 420 MHz Sensitivity: 1 - 100 mV ● Frequency Controller SMDA-Z with Counter Adapter		100.4542.03 100.8131.02	3.2.4 3.2.5 3.2.6 5.4.1
4	○ Frequency counter f: 400 - 700 MHz			3.2.16 5.4.2
5	○ RF voltmeter V_{AC}: 0.1 mV - 10 V f: 0.1 - 15 MHz ● Microvoltmeter	UVM	110.2994.02	3.2.4 3.2.5

No.	○ Instrument, required data ● Recommended R&S unit	Type	Order No.	Use in section
6	○ Attenuator set Z = 50 Ω; 0 - 100 dB, adjustable in 1-dB steps f = 10 - 500 MHz Attenuation error < 0.1 dB ● UHF attenuator set 50 Ω	 DPU	 100.1737.50	3.2.3 3.2.8 5.3.7 5.4.5 5.5.2 5.5.3
7	○ Load resistor 15 Ω; 1 W			3.2.9
8	○ Pulse generator Z = 50 Ω; V_{out} = 5 V (into 50 Ω) τ < 30 ns pulse width f_p: (0) 1 - 1000 Hz PRF t_r < 10 ns rise, fall time Pulse area constant when PRF changes e.g. Hewlett-Packard HP 8002A			3.2.11
9	○ Power signal generator f: 10 - 500 MHz Z = 50 Ω V_{out} up to ≈ 7 V (into 50 Ω) ● Power Signal Generator	 SMLU	 200.1009.02	3.2.13 3.2.14
10	○ Oscilloscope Y: 0.01 V - 30 V/cm X: 0.1 µs - 1 s/cm f: 15 MHz e.g.: Tektronix			3.2.9 3.2.11 5.1.1 5.3.2 5.3.3
11	○ Load resistor adjustable; 100 Ω; 10 W			5.1.2
12	○ Load resistor adjustable; 1 kΩ; 10 W			5.1.2

No.	○ Instrument, required data ● Recommended R&S unit	Type	Order No.	Use in section
13	○ Power supply V: 1 - 24 V regulated J: 1 A			5.1.2 5.2.2 5.2.3 5.5.4
	● Power Supply	NGG	100.5078.05	
14	○ Sweep generator f: 1 MHz - 1.2 GHz			5.3.1 5.3.5 5.3.6 5.3.7 5.4.3
	● Polyskop III SWOB			
	Display Unit		100.5349.92	5.4.4
	and Sweep Generator with sweep oscillators II...VII		100.5249.51	5.5.1 5.6.3
	and X-deflection plug-in Narrow-band sweep oscillator 9.5 - 12.5 MHz		100.7987.02	
15	○ Spectrum analyzer with storage tube f = 0 - 500 MHz e.g.: Hewlett Packard HP Spectrum Analyzer 141 T with RF Section 8554 L and IF Section 8552 A			5.4.1 5.6.2
16	○ Noise generator f: 1 - 1000 MHz, 50 Ω			5.4.3
	● Noise Generator	SKTU	100.4688.50	
17	○ Reflectometer 50 Ω; 20 - 400 MHz 0.5 - 100%			5.4.5
	● Reflectometer	ZRZ	201.6010.05	
18	○ Selective voltmeter f: 0.4 - 30 MHz V_{in}: 0.1 µV - 0.1 V Noise figure approx. 6 dB			5.4.3.3
	Selective Voltmeter	HFH	100.1014.02	

No.	Instruments, required data Recommended R&S unit	Type	Order No.	Use in section
19	○ Sampling oscilloscope e.g.: Tektronix 540, 550 or 580 with Dual Trace Amplifier 1A1 and 350 ps Sampling Amplifier 1S1			
20	○ Power meter f: 0 - 500 MHz Z = 50 Ω P: 0.1 - 100 mW			
	● Microwave Power Meter with measuring head 50 Ω	NRS	100.2433.9	
21	○ Test receiver f: 25 - 1100 MHz			
	● VHF-UHF Test Receiver with RF Plug-ins I II III IV and modification kit 60/50 Ω	ESU	100.1143.0 100.1189.02 100.1195.02 100.1208.02 100.1214.02	
22	○ Millivoltmeter f: up to 700 MHz			
	● RF-DC Millivoltmeter with 50-Ω insertion unit	URV	216.3612.02 243.9418.54	

3.2 Checking the Performance Specifications

3.2.1 Checking the Battery- and AC-supply voltage

Checking the battery voltage

▷ Instrument not connected to AC supply; switch 14 at ⊙ and BATT. 15 depressed.

▷ Indication of meter 2 must be in the blue range above scale III. When dry cells are used, a slightly higher indication is permissible.

Voltage check with AC supply operation

▷ Connect instrument to AC supply.
POWER lamp 9 lights briefly.

▷ Switch 14 at ⊙ and BATT. 15 depressed.

▷ Indication of meter 2 must be in the blue range above scale III.

Note

If a dry battery is built in the instrument must not be connected to the AC supply.

The DC voltage may also be measured with a multimeter at socket BU21 (+12 V) 24 (with series M 2071).

Voltage with AC supply operation ..... +13.4 V ±0.2 V

Voltage with battery operation ..... +11.9 V - +15.6 V (depending on battery charge)

3.2.2 Pulse Generator

▷ Buttons 16 CALIB. (pulse generator on) and 4 CHECK depressed.

▷ Indication of meter 2 must be in the blue range CHECK below scale II.

▷ Aural monitoring is possible with loudspeaker 25 or head phones connected to the AF output 23 , if FM-AM button 19 is also depressed.

▷ Turning CALIB. knob 13 it must be possible to adjust the indication of meter 2 to CAL (f.s.d. of scale I).

▷ Release CALIB. button 16 .
The absolute accuracy can be checked according to section 3.2.12.

3.2.3 Checking the Meter Indication

* 3.2.3.1 Scale

▷ Switch 17 to AVERAGE, attenuator 5 to +10 dB and 18 to LIN. Instrument calibrated.

▷ Apply unmodulated sinewave signal to INPUT 75 Ω 1 via attenuator set. Adjust signal generator level such that f.s.d. is obtained on meter 2 .

▷ Adjust signal generator level to 2, 4, 6, 10, 15 and 20 dB below f.s.d. Permissible scale error ..... ±0.5 dB

▷ Button 18 at LOG.
Adjust signal generator level for f.s.d. on meter 2 .

▷ Reduce signal generator level in 10-dB steps to 60 dB below f.s.d. Permissible scale error ..... ±2 dB.

3.2.3.2 Agreement of AVERAGE and PEAK Indication

▷ Apply unmodulated sinewave signal to BNC socket INPUT 75 Ω 1 .
17 at AVERAGE, 18 at LIN. and 5 at ≥ +10 dB.
Adjust signal generator level for f.s.d. on meter 2 .

▷ Change 17 to PEAK
Permissible deviation of indication ..... ±0.5 dB.

▷ Repeat measurement with 18 at LOG.
Permissible deviation of indication ..... ±2 dB.

▷ Apply AM sinewave signal to BNC socket 1 (50% mod; f_{mod} = 1 kHz).
17 at PEAK and 18 at LIN.
Adjust signal generator level for f.s.d. on meter 2 .

▷ Change 17 to AVERAGE.
Nominal indication ..... 16.5 dB ±0.4 dB.

3.2.4 IF Passband Characteristic

See test setup Fig. 3-1

▷ Apply unmodulated signal to BNC socket 1 INPUT 75 Ω.
The 6-dB bandwidth can be determined with the aid of the scale and the Frequency Controller.

▷ By varying the signal generator frequency determine:
IF midband frequency ..... 10.7 MHz
6-dB bandwidth ..... 36 kHz ±2 kHz (100 K with 203-6018-03)
Frequency response in passband ..... < 1.5 dB.

The passband characteristic may also be displayed on a sweep generator (e.g. [illegible] with X-deflection amplifier), the sweep generator sawtooth must, however, drive the synchronizing input of the SMDA.

3.2.5 IF Output Level

See test setup Fig. 3-1

▷ Apply unmodulated signal to BNC socket 1 INPUT 75 Ω. With AVERAGE indication, adjust the signal generator level for f.s.d. on meter 2 .

▷ Voltage at 10 with 50-Ω termination+) ..... 25 - 30 mV
Linearity beyond f.s.d. ..... > 6 dB.

+) The input of the Frequency Controller 100.4542.03 used in Fig. 3-1 has an input impedance of 50 Ω.

3.2.6 Tuning Indication and AFC

See test setup Fig. 3-1.

3.2.6.1 Tuning Indication

▷ Apply unmodulated signal to BNC socket 1 INPUT. Adjust frequency at OUTPUT 11 to 10.700 MHz.

▷ Indication on meter 6 ..... about mid-position.

▷ Disconnect signal generator from 1 INPUT and terminate 1 with 50 Ω.

▷ Indication on meter 6 ..... about mid-position.

NOTE: DIFFERENCE ENTRE LOG/LIN

3.2.6.2 AFC

▷ Tune to a signal generator signal of any frequency in the range 25 to 300 MHz such that the tuning indication is at about mid-position.

▷ Depress button 21 AFC. The tuning indication should remain at mid-position.

▷ Vary the signal generator frequency slightly: the AFC holding range should be ≥ 500 kHz.

3.2.7 Checking the Tuning Scale

▷ Apply signal generator signal to BNC socket 1 INPUT 50 Ω. Tune HFV accurately to any frequency marker on scale 7.

▷ Adjust signal generator coarsely to the frequency set on 7. Then adjust the signal generator accurately until the indication on meter 6 is at mid-position. Read the signal generator frequency on the Frequency Controller.

▷ Permissible deviation of signal generator frequency from receive frequency adjusted on HFV ..... $\pm(5 \times 10^{-3} f_{rec} + 500\ kHz)$

Make this check at several frequencies within the reception range of 25 to 300 MHz.

3.2.8 Attenuator

See test setup Fig. 3-2.

▷ Tune signal generator and HFV to 300 MHz. Set attenuator 5 to 0 dB and external attenuator set to 90 dB. Adjust signal generator level for +18 dB on meter 2 with LIN. indication.

▷ Increase HFV attenuation in 10-dB steps and simultaneously reduce external attenuator set in 10-dB steps.

Deviation from 18-dB indication:

at 10 to 70 dB ..... < 0.5 dB

at 80 dB ..... < 1.0 dB

3.2.9 Demodulation

▷ Connect 15-Ω load resistor and oscilloscope to AF output 23.
Select AVERAGE and LIN. indication.

▷ Apply signal generator signal to BNC socket 1 INPUT 50 Ω.
Adjust level for f.s.d. on meter 2.

Amplitude modulation

30% modulation; f_{mod} = 1 kHz; knob 19 at mid-position.

V_{rms} ..... ca. 1.4 V

Frequency modulation

f_{mod} = 1000 Hz; deviation = 20 kHz; knob 19 at mid-position.

V_{rms} ..... 1.4 V.

3.2.10 Recorder Output

▷ Apply unmodulate signal from signal generator to 1 INPUT.
Measure off-earth at sockets 12 RECORD with a high-resistance DC voltmeter ($Z_{in} \geq 1$ MΩ).

▷ With LIN. AVERAGE adjust for f.s.d. on meter 2.
Voltage at 12 ..... 8.7 to 9.2 V.

3.2.11 Peak Indication with Pulses

This measurement calls for a pulse generator delivering pulses of constant pulse area with varying repetition frequency, e.g. Hewlett Packard Type HP 8002 A.

▷ Apply pulse to 1 INPUT 50 Ω; adjust pulse width (τ) and rise and fall times (τ_r, τ_f) to minimum ($\tau < 30$ nsec, PRF = 1 kHz).
Tune HFV to 30 MHz.

▷ Adjust pulse amplitude for f.s.d. with PEAK indication and check PRF with oscilloscope at IF output.

▷ Reduce PRF to 50 Hz.
Indication on meter 2 ..... > 15.5 dB.

3.2.12 Absolute Accuracy with LIN. AVERAGE Indication

▷ Switch the HFV to LIN, AVERAGE indication and calibrate.
Attenuator 5 at (+10 dB) +20 dB
Tune to 25 MHz. - 71 dBmw

▷ Apply sinewave signal with 36 dB (µV) EMF (Z = 50 Ω).
Permissible error ..... < 2 dB
Repeat the check at several frequencies.

3.2.13 RF Stray Pickup with Battery Operation

▷ Switch HFV to LIN. AVERAGE indication and calibrate.
Attenuator 5 at +80 dB.
Tune to 300 MHz.
Receiving dipole connected.

▷ A power signal generator with another HFV dipole at its output is used as signal source.

▷ Arrange the two dipoles at a distance of 2 m apart.
Adjust signal generator level for f.s.d. on meter 2 .(+17 dbm)

▷ Remove receiving dipole; terminate receiver input with 50 Ω (check for RF leakage of terminating resistor). garder constamment sur Generateur à 2 metres.
Attenuator 5 at 0 dB.
Indication ..... < 10 dB (µV).

3.2.14 Antenna Factor

Check the antenna factor by substituting the receiving dipole with another HFV dipole of known antenna factor.
The test setup of Fig. 3-4 can be used for coarse measurement. The indication must be approximately equal with the two dipoles.

For accurate measurement the distance between the transmitting and the receiving antenna should be more than 20 metres; a standard dipole should be used for reference.

3.2.15 Squelch

▷ Attenuator switch 5 at +10 dB; button SQUELCH 20 depressed.
Indication AVERAGE LOG.; apply modulated signal from signal generator to 1 INPUT.

▷ Adjustment range of response threshold between the ends of R5 on squelch board 204.1632:
≥ -3 to +40 dB on scale II of meter II.

3.2.16 Oscillator Output

Measure according to Fig. 3-3 at OSC. output 11 :
Voltage about 40 mV with RF millivoltmeter and 50-Ω termination;
frequency in range 425 to 700 MHz with frequency counter.

3.3 Cleaning the Instrument

The anodized front panel and all varnished parts should be cleaned with a soft cloth. Strong contaminations can be removed with alcohol. Do not apply organic solvents.

The interior can be cleaned, if necessary, with a brush or with compressed air (max. pressure 1 atm).

3.4 Storage

Permissible shelf temperature

with DEAC cells ..... $-40^{\circ}C$ to $+60^{\circ}C$
without DEAC cells ..... $-40^{\circ}C$ to $+70^{\circ}C$.

Should the HFV be stored for an extended period of time, it is recommended that the cells be taken out of the unit and discharged. After the battery has been recharged no warm-up time is required for the set.

4.1 Overall Description of Test Receiver

See block diagram (Fig. 1-1) in operating manual.

The VHF Test Receiver Type HFV is a double heterodyne receiver with intermediate frequencies of 400 MHz and 10.7 MHz. The antenna is a dipole with a coaxial downlead which is fixed to the receiver and can be tilted and rotated. In the range 25 to 60 MHz it operates as a shortened dipole and from 60 to 300 MHz as a tuned half-wave dipole. Field strength E' is determined from the indicated voltage E by means of an antenna factor curve

$$\frac{E'}{\text{dB above 1 } \mu V/m} = \frac{E}{\text{dB above 1 } \mu V} + \frac{k}{\text{dB}} .$$

The RF attenuator is switchable in 10-dB steps from 0 to 70 dB. For calibration of the test receiver, a pulse generator can be switched into circuit, which delivers nsec pulses of 100 Hz PRF with a spectrum of constant amplitude up to 300 MHz. Type of indication and IF attenuation are so arranged that the instrument can be calibrated independently of the setting at any frequency. The calibration is performed by varying the gain in the 2nd IF (10.7 MHz) with a potentiometer which is accessible on the front panel. This method ensures that the high measuring accuracy of the HFV is very quickly established. Satisfactory performance of the pulse generator can be checked on the meter.

The tuned input circuit is automatically switched over at about 120 MHz during frequency tuning. From there the input signal is applied to a diode mixer. The preceding bandpass filter (25 to 300 MHz) improves the IF rejection to more than 75 dB+) and the suppression of spurious responses (e.g. image frequency $f_{iml} = f_{rec} + 2f_{IF1}$) to more than 80 dB and reduces oscillator reradiation.

To provide high rejection of spurious responses and of intermodulation, a tunable input filter without RF gain and diode mixers which are linear up to high levels are used, a certain loss in input sensitivity being tolerated.

Tuning without band switching is possible thanks to the 1st oscillator frequency lying above the receive frequency, the 1st IF being 400 MHz.

+) more than 80 dB for production batch M 2071 and higher.

The frequency of the 1st oscillator can be measured at the oscillator output with a frequency counter; the tuned in receive frequency can be accurately determined by subtracting f_{IF1} = 400 MHz.
The required selectivity ahead of the second mixer is achieved by an IF filter with an attenuation pole at 421.4 MHz, increasing the image frequency rejection ($f_{im2} = f_{rec} - 2f_{IF2}$) to more than 80 dB. The second oscillator is a crystal-controlled fixed-frequency oscillator.
Switch-selected AFC facilitates long-term observation of received signals.
The following IF amplifier with adjustable gain (10.7 MHz) includes a crystal filter with a 6-dB bandwidth of 36 kHz.
This bandwidth is normally sufficient to resolve most signals in channel operation. The subsequent IF attenuator (0/10 dB) implements the 1st 10-dB step on operation of the level switch and reduces the noise contribution of the preceding stages with sufficiently strong input signals. For signals above 20 dB (µV) the S/N ratio in the indication thus increases.

After the IF attenuator the signal is processed for peak-value or average-value indication. The subsequent logarithmic amplifier is operated with a constant control voltage in the LIN. position and with a level-dependent control voltage in the LOG. position. The next amplifier with the IF output of 10.7 MHz, EMF ≈ 50 mV at f.s.d., is followed by the FM, AM and meter detectors. PEAK or AVERAGE indication are switch-selected, the charging time constant for PEAK being less than 100 µsec and the discharge time constant about 1 sec. Thus the rms value of the carrier of TV signals is indicated at sync level independent of the picture content. The following meter amplifier contains only a FET impedance transformer with high input impedance for driving the moving-coil meter.
The instrument also includes a switch-selected squelch whose threshold can be preset when the chassis is removed from its cabinet.

The AF amplifier feeds the built-in loudspeaker or, via the AF socket, a headset. When the headset is switched on, the internal loudspeaker is off so that acoustic feedback which might occur with high AF gain is avoided.

The Test Receiver can be operated from the AC supply or a built-in battery. After rectification, DC voltage regulation or, during battery charging, DC current regulation takes place. After a charging time of about 14 hours, the battery lasts for 7 hours of operation. The battery charge can be checked in the meter by depressing the BATT. button.

Stray RF pickup may play an important role in field-strength measurements. Internal shielding and a sealed cabinet suppress stray pickup so far that, even with the maximum field strength that can be measured with LIN indication (about 1 V/m), the meter indication is below 3 µV with full sensitivity and with the input terminated.

4.2 RF Section

See circuit diagram 203.6018 S Bl. 3

4.2.1 Antenna, RF Attenuator, Input Circuit and Bandpass Filter

The antenna is a dipole with a coaxial downlead. The balun TR351 is incorporated in the antenna bracket. The antenna functions as a shortened dipole in the range 25 - 60 MHz and as a tuned half-wave dipole above 60 MHz.

The antenna is fixed to a conical holder on the outside of the cabinet. The telescoping support can be tilted and rotated when the fixing knob on the holder is released.

The antenna is connected to the RF attenuator S1 via cable K2; see also circuit diagram 204.0571 S. Attenuation can be set in 10-dB steps from 0 to 80 dB. Switchover from 0 to 10 dB is performed in the 10.7-MHz IF amplifier (the RF attenuator switch S1 is ganged with switch S6 which switches the DC voltage for the IF attenuator T19).

The RF attenuator is followed by an input circuit which is automatically switched at about 120 MHz. The tuning capacitors C20I (120 - 300 MHz) and C20II (25 - 120 MHz) are ganged with the tuning of the 1st oscillator (C21).

In the course of tuning the microswitches S2 and S3 are switched at about 120 MHz; they in turn control the pulse relays RsB in Y2 and Y3.+)

The bandpass filter 203.8027 (25 - 305 MHz) provides the following improvements:

10.7-MHz IF rejection	> 80 dB
400-MHz IF rejection	> 80 dB
Rejection of spurious responses	> 80 dB
Reduction of oscillator reradiation	

+) From serial number 870 119 onwards: only one microswitch: S2.

4.2.2 1st Oscillator, 1st Mixer, Oscillator Output, 400-MHz Amplifier (1st IF)

The 1st oscillator (203.6318) operates in the range 425 - 700 MHz. The tank circuit is a $\lambda/2$ circuit. The tuning procedure varies both its length and its terminating capacitance. The power delivered by transistor T5 suffices to drive the mixer.

The mixer is a broadband balanced diode mixer, equipped with hot-carrier diodes which ensure low insertion loss. The oscillator voltage is applied via a balun and mixed with the input signal. The diode current can be checked at a check point; it is a measure of oscillator power.

The 1st-oscillator signal is conveyed to the front-panel socket Bu26 via a voltage divider and cables K6 and K12.

The difference frequency $f_o - f_{rec} = f_{IF1}$ is applied to the input of the 400-MHz amplifier. The single-stage IF amplifier is equipped with a MOS-FET (N channel, dual gate) presenting high linearity and a low noise figure. The transistor is followed by a filter with double attenuation pole at 421.4 MHz. The image-frequency rejection $f_{im2} = f_{rec} - 2f_{IF2}$ is thereby improved to > 80 dB (f_{IF2} = 10.7 MHz).

4.2.3 2nd Oscillator, 2nd Mixer, 10.7-MHz Amplifier (2nd IF)

The 2nd oscillator operates at a fixed frequency stabilized by crystal Q1. The fundamental of 68.45 MHz is distorted with diode G1 4. The following three selective amplifiers T8, T9 and T10 filter out and amplify the 5th harmonic.

The 2nd mixer is equal in design to the 1st mixer. The mixer output is connected to the 10.7-MHz amplifier. The latter has a narrowband input circuit to reduce the voltage effective at the input in the case of pulses. The two amplifier stages preceding and following the 36-kHz crystal filter are equipped with MOS-FET's T17 and T18 (N channel, dual gate). For both transistors the IF gain is adjusted via the second gate. This is performed with the front-panel adjustment CALIB. (R160).

The crystal bandpass filter has the following typical data:

6-dB bandwidth	36 +2 kHz
80-dB bandwidth IF filter selectivity	> 80 kHz
Stopband attenuation	> 80 dB
Ripple in passband	< 2 dB

The amplifier T18 is followed by the IF attenuator. The junction FET T19 is used to switch resistor R88 into or out of circuit. With a gate channel voltage of -9 V this FET has high impedance (0 dB attenuation) and with 0 V

low impedance (10 dB attenuation). Impedance transformer T20 provides isolation from the following stage (log. IF amplifier).

This IF attenuation is effective with all level switch settings $\geq$ +10 dB. With sufficient input voltage it reduces the noise contribution of the preceding stages and improves the S/N ratio in the indication and AF demodulation.

4.2.4 Log. IF Amplifier

See Fig. 4-1.

The impedance transformer T20 is followed by plug ST17 and the log. IF amplifier. ST17 has no function in the present instrument version 05. The basic function of the log. IF amplifier is illustrated in Fig. 4-1.

The drain-source resistances of the FET's T21, T22, T25 and T26 are adjusted by the control voltage E_C, which is kept constant for linear operation, whereas for logarithmic operation it is adjusted by means of a control demodulator so as to produce a logarithmic indication characteristic. The control voltage is independent of the AM degree with average indication but dependent on the AM degree with peak indication. The difference between average and peak indication according to the definition given in section 2.2.3.1 of the operating manual is thus maintained also with logarithmic indication.

4.3 Demodulator Section

4.3.1 Power Amplifier

The logarithmic IF amplifier is followed by the integrated power amplifier B2. The low-impedance push-pull output of the latter is connected to the primary winding of transformer TR3.

The signals for the IF output 10.7 MHz, the FM demodulator and the impedance transformer T30 are tapped at the secondary winding of TR3.

The IF output delivers an EMF of about 50 mV ($Z = 50\ \Omega$) at f.s.d. of the meter. The overdriving capacity of this output is about 10 dB above f.s.d.

4.3.2 FM Demodulator, Tuning Indicator and AFC

The integrated limiter demodulator B3, operating on the principle of the coincidence demodulator, demodulates the FM signal. Its output is applied to the tuning indicator J2 and button S4 III AM/FM.

When the AFC button is depressed, the frequency of the 1st oscillator is tuned to any received signal by means of the tuning-error signal produced by the FM demodulator via the AFC board Y10. The frequency correction of the 1st oscillator is performed by variation of the base voltage of T5.

4.3.3 AM Demodulator

The signal tapped at transformer TR3 is applied to the AM detector G1 6 via the impedance transformer T30. The demodulated signal is taken via point 10 to button S4 III AM/FM.

4.3.4 Control Demodulator

The control voltage for linear operation is produced by means of the Zener diode G1 7 and can be adjusted by varying R135.

A level-dependent DC voltage is superimposed on the constant control voltage for logarithmic operation. It is produced by demodulation with diode G1 8 and voltage division. The potentiometers R148 for PEAK and R152 for AVERAGE are used to adjust the indication characteristic.

The RC section for peak indication has a high discharge time constant (C187), that for average indication a low one (C171/R149). The combination R155 in shunt with R154 and R150 with C188 provides AF filtering. The control voltage is applied to the transistors of the log. IF amplifier via C148.

4.3.5 Meter Detector

Diode G1 9 demodulates the 2nd IF for indication. As in the control demodulator, an RC section with a high discharge time constant is used for peak indication (C186/R144/R145) and one with a very low time constant for average indication (C170 and R143). R142 and C185 are used for AF filtering.

4.4 Indicator Section

4.4.1 Meter Amplifier

The meter amplifier consisting of the FET's T17 and T15 is a high-impedance differential amplifier. The electrical zero of the meter is set with potentiometer R57.

The amplifier has two outputs which are connected to the meter depending on the type of operation. The output connected via point 9 produces f.s.d. (peak/average indication) with 10 V, the one taken via point 8 gives f.s.d., with an input voltage of 1 V but is not used in the instrument version 05. The moving-coil meter movement has no mechanical damping; it is critically damped by resistors R58 or R53 and R54.

The output voltage of the meter amplifier is applied to sockets Bu22 and Bu23 (RECORD)+) via resistors R211 and R212. The indicated voltage can thus be plotted with a recorder.

4.4.2 AF Amplifier and SQUELCH

The demodulated AM or FM signal, depending on the position of switch S4 III AM/FM is applied to the input of the integrated AF amplifier B1. Button S4 II remains in rest position.

The output transformer TR2 transforms the impedance to the value (Z = 15 Ω) required for the built-in loudspeaker. Potentiometer R158 is used to adjust the volume.

A headset can be connected via a jack, cutting the built-in loudspeaker automatically off.
The loudspeaker and the AF output are connected to the AF amplifier via relay contact rs C2 on the squelch board Y9 (204.1632). In the normal state (SQUELCH button 20 not depressed, meaning +9 V at contact 2 of board 204.1632), this contact is closed. When the SQUELCH button is depressed, the DC voltage from the AM demodulator controls the SQUELCH contact. Potentiometer R5 on the squelch board is used to adjust the response threshold of the squelch (see section 2.3.1.1 of operating manual).

4.5 Pulse Generator (for Calibration)

A pulse generator can be switched to the RF input for the calibration of the test receiver. Relay RsA switches the RF input from the level switch over to the pulse generator output. The pulse generator produces very narrow pulses (< 1 nsec) with an PRF of 100 Hz, having the effect of Dirac pulses in the frequency range 25 to 300 MHz. They thus produce a spectrum of constant amplitude up to 300 MHz (typical frequency response $< \pm 1$ dB). On pressing the button S4 VII CALIB. the following changeovers occur:

- ▷ +9 V supply to pulse generator:
  Relay RsA switches the RF input to the pulse generator.
- ▷ +9 V supply to IF attenuator:
  10 dB IF attenuation, independent of level switch position
- ▷ Switchover to LIN. PEAK, independent of positions of S4 IV LIN/LOG and S4 V AVERAGE/PEAK.

These switching actions considerably facilitate the calibration procedure because no conditions for switch positions are made.

+) Not contained in the circuit diagrams of production batch M 1958.

For aural monitoring of the pulses the AF demodulation must be switched to AM since the pulses are not audible in the noise with FM.

Function of Pulse Generator

See Fig. 4-2

The astable T1/T2 produces a squarewave signal with a small duty cycle. The time constant C6 (R6 + R7) determines the repetition rate, which is adjusted to about 100 Hz with R6. Rise time is adjusted with R3. Transistor T3 isolates the multivibrator from the following stages and steepens the pulse edges.

This driving pulse cuts the step-recovery diode G1 2 off, producing a steep voltage jump at G1 2. This voltage jump is differentiated via C9 and conveyed to the attenuator R10/R11+)/R12. C9, L3 and R26 compensate for the overall frequency response.

The attenuator R10/R11+)/R12 isolates the pulse generator output from the RF input and provides the required input level. Diode G1 1 rectifies the driving pulse with high impedance, producing a DC signal which indicates correct functioning of the pulse generator on meter J1 when the CHECK button S5 is depressed.

4.6 Power Supply

The instrument can be powered from the AC supply or from a battery. Chargeable NiCd storage batteries or even dry batteries may be used. It is, however, to be noted that when dry batteries are used the instrument must in no case be connected to the AC supply and the operating time is only about 3 hours.

The following types of operation are possible:

- AC supply operation without batteries built in
- AC supply operation with batteries built in (buffer battery operation)
- Charging operation (for storage batteries)
- Battery operation (storage batteries or dry batteries)

4.6.1 Power Section

The AC supply voltage is fed in via ST18. The filters D6 and D7 provide the protection from stray RF pickup required in field-strength meters. Next

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+) In the instruments of series M 1958/1 to 50, R11 is divided into R11 and R16.

follow two fuses (SI2 and SI3). The voltage selector can be set for operation from AC supply voltages of 110, 115, 125, 220 or 235 V. Voltage fluctuations of -15 to +10% of the nominal values engraved are permissible; only with extreme deviations is a changeover necessary.

Glow lamp RL 1 lights when the instrument is connected to the AC supply voltage, independent of the position of button S4 VIII (• ◯ CHARGING or ⊙).

4.6.2 Stabilizing Circuit

The stabilizing circuit (T32 to T36) has the following functions:

- ▷ Voltage regulation for AC supply operation without batteries. The voltage at point 15 is regulated to about 13.6 V.
- ▷ Voltage regulation for AC supply operation with built-in batteries. The voltage must not exceed 13.6 V to prevent overcharging of the batteries. Fully discharged batteries are charged within a short time to 10% of their nominal capacity. When fully charged (with CHARGING) they are only slightly discharged in this type of operation.
- ▷ Current limiting to about 600 mA in case of short circuit or of totally discharged NiCd cells.
- ▷ Current regulation to about 150 mA in charging operation with built-in NiCd cells. This gives a charging time of 12 to 14 hours. The maximum permissible charging time of 100 hours should be avoided for the sake of a long life of the cells.
- ▷ Voltage limiting to max. 15.4 V to protect the components in AC supply operation with button S4 VIII (• ◯ CHARGING / ⊙) switched off and with built-in battery.

The output voltage E_{out} is to be kept constant by regulation of the collector current of T34. The output voltage is applied to the base of T32 via the voltage divider R179 R180 and R182 R183. Transistors T32 and T36 form a differential amplifier, T36 drives the Darlington stage T33/T34. E_{out} is regulated to 13.6 V.

In CHARGING, resistor R181 is in parallel with R179 R180 via S4 VIII. Thus the output voltage is limited to 15.4 V in charging operation; the components of the stabilizing circuit are thus protected when no battery is incorporated.

The load current is limited by transistor T35. If the current through R188 R189 R190 rises above 600 mA, T35 conducts, reducing the base current of T33 and thereby limiting the collector current of T34.

In CHARGING, R188 is disconnected and current limiting is initiated at 150 mA. +++)

4.6.3 +9-V Supply

The integrated voltage regulator B4 regulates the +9-V supply. +12 V is applied via contact 3. The regulated +9-V voltage is derived at points 1, 4 and 5. Internal current limiting prevents the load current from increasing beyond 700 mA.

The output voltage is adjusted to +9 V ±50 mV with the voltage divider R171 R172 + R173 R174. Capacitor C207 suppresses noise. C205, C206, R169 and C208 suppress any oscillations of B4.

4.6.4 Battery Protecting Circuit +)

Fuse SI1 protects the batteries from damage by short circuit. The protective circuit T37/T38 has been incorporated to prevent complete discharging of the batteries. If the voltage at point 12 drops below about 10.5 V ++), the base current of T38 decreases. Because of the high current gain of T38 the base current of T37 decreases very much and the voltage at point 12 decreases further. T38 and T37 are cut off and the circuitry is separated from the battery. The transistors conduct again when the instrument is switched on anew. In the cut off state (S4 VIII at • ◯ CHARGING), C213 is discharged. Upon switching on, the charging current of C213 suffices to render T38, and consequently T37, conducting. In order to maintain the switched-on state, the full battery voltage must be present (charge storage batteries, replace dry battery).

In AC supply operation, diode Gl 20 (FNr. M 2071/59 and higher) ensures that the protective circuit is automatically switched on again after it has responded, for example, due to switching pulses or to an AC supply failure.

+) This circuit is not contained in instrument series M 1958/1 to 50.

++) For FNr. 2071/59 and higher with Gl 21 taken to chassis; earlier units about 11.85 V with emitter of T28 taken to point 10.

+++) 180 mA for FNr. 870 256 and higher

4.6.5 Battery Check

In position ⊙ of button S4 VIII the voltage at point 25 (or 12) of the power supply board 204.1110 (or 203.8210) can be checked, when button S4 VII BATT is depressed. The battery voltage is applied to meter J1 via resistors R175 R176, which together with R157 and the internal meter resistance form a voltage divider.

If the meter indication is below the blue mark, the NiCd cell require recharging. Charging time is about 14 hours for an operating time of about 7 hours (with DEAC RS 1,8).

4.7 Mechanical Construction

See Figs. 4-3 and 4-4.

The instrument consists of a frame to which all subassemblies and the front panel are fixed. The frame is accommodated in a steel cabinet; the four fixing screws are accessible on the front panel. Contact springs fixed to the front panel provide good conductive connection between front panel and cabinet, thus ensuring good shielding.

The instrument has an adjustable carrying handle. The unit together with the dipole (folded down), tape measure, antenna-factor chart, spare fuses and power cable can be accommodated in the HFV leather carrying case.+)

The subassemblies are connected by way of RF plug-and-socket connections. The RF cables are double shielded to avoid stray RF pickup.

The wiring consists of the main cable harness which interconnects the subassemblies. Another cable harness makes the internal wiring of the power section. The wiring is centred at the pushbutton assembly with circuit board 203.8933.

The built-in loudspeaker is shock-mounted to prevent acoustic feedback. Because of the shielded construction, singing cannot be fully precluded at high AF gain; if necessary, an external loudspeaker or headset 204.0220.00 should be used.

+) For FNr. 870 256 and higher; with series 870 119 and M 2180 accommodated in the cover.

5. Repair

This section contains instructions for repair work. The measuring instruments required for the individual measurements and adjustments are listed in section 3.1.

The measurements and adjustments are quoted in the order corresponding to a new adjustment of the HFV. If only single adjustments are made, it should be checked by referring to the circuit description (section 4) and circuit diagrams whether other subassemblies are affected.

5.1 Power Supply

5.1.1 Power Section

See Fig. 5-1.

Current drain

Measure the current with the nominal AC supply voltage E_{rms} = 220 V, connecting an ammeter in series instead of fuse SI2 or SI3.

▷ Normal operation: battery not incorporated; button S4 VIII at ⊙ and S4 V at AVERAGE.

I_{rms} ..... approx. 36 mA

▷ Charging: storage battery incorporated; button S4 VIII at CHARGING • ◯

I_{rms} ..... approx. 30 mA

Secondary voltage at power transformer TR5

Voltages with typical current drain

I_1 = 100 mA, I_2 = 200 mA (connect contacts 25 and 12)

Secondary voltage E_{rms} of TR5 (between contacts 13 and 14) ..... 21.0 ±1 V

DC voltage at C212 ..... 22.5 ±1 V

Hum E_{pp} at C212 ..... 3.5 V

5.1.2 Stabilizing Circuit

See Fig. 5-1

Output voltage +12 V

▷ Measure with multimeter or oscilloscope between point 15 and chassis; button S4 VIII at ⊙ .

▷ DC voltage E_1 ..... +13.6 V ±0.2 V
Hum E_{pp} ..... 3 mV +4 mV noise
Increase voltage by increasing value of R183.

▷ E_1 must remain constant (±0.2 V) with AC supply varying between 180 and 250 V.

Check of current limiting

▷ Check with battery removed; button S4 VIII at ⊙ ;
Fuse SI1 removed; $I_2 = 0$.

▷ Measure with ammeter in series with adjustable load resistor (1 kΩ, 10 W) between point 15 and chassis.

▷ Adjust load resistor R_1 such that $E_1 = 12.0$ V.
Max. current I_1 ..... 590 ±50 mA +)

▷ Correct limiting threshold, if necessary, by varying R188.

Voltage limiting in charging operation

▷ Measure voltage with multimeter between points 15 and 17.

▷ Battery removed; button S4 VIII at • ◯ CHARGING ; $I_2 = 0$.

▷ Adjust load resistor R_1 such that $I_1 = 100$ mA.
Max. voltage E_1 ..... 15.4 ±0.2 V

▷ The voltage can be increased by reducing R181.

Current limiting in charging operation

▷ Battery removed; button S4 VIII at • ◯ CHARGING .
Connect adjustable load resistor R_1 in series with ammeter between point 15 and 17; $I_2 = 0$.

▷ Adjust load resistor R_1 such that $E_1 = 12$ V.
Max. current I_1 ..... $150\ ^{+10}_{-5}$ mA ++)

Correct if necessary with R190 (I_1 can be increased by reducing R190).

Output voltage +9 V

Connect point 12 to point 25.

+) With FNr. 870 256 and higher: 620 ±50 mA

++) With FNr. 870 256 and higher: 180 ±15 mA

Using 100-Ω load resistor R_2 adjust current I_2 to 200 mA.

Voltage E_2 at point 10 ..... 9.00 ±0.05 V

Voltage can be increased by increasing R172 or reducing R174.

Voltage at point 10 remains constant up to about 11.4 V at point 12 (important with battery operation).

Remove connection between points 12 and 25.

Protection against battery run-down

Not applicable for instruments with FNr. M 1958/1 to 50.

Checking the switch-off threshold

See test setup Fig. 5-2

Remove fuse SI1

Apply ext. DC voltage of +13.5 V at point 25 (minus pole at 17)

Button S4 VIII at ⊙ .

Reduce external DC voltage down to switch-off threshold.

Threshold ..... ca. 10.5 V+)

5.2 Meter Amplifier

5.2.1 Zero Setting of Meter I1

Mechanical zero

▷ Set pointer to M by means of screwdriver adjustment while the set is switched off.

Electrical zero

▷ Unsolder lead from contact 6 on circuit board 203.7995 and connect contact 6 to chassis.

▷ Switch instrument on.
Adjust indication to M using R57.

▷ Disconnect contact 6 from chassis.

+) For FNr. M 2071/58 and higher; about 11.85 V for FNr. M 2071/1 to 57. Threshold voltage can be reduced by reducing R166. If threshold too low, the +9-V voltage drops before switch-off through T37/T38. Therefore check this voltage after any change of R166.

5.2.2 F.s.d. of Meter I1

F.s.d. 10 V

▷ Apply exactly +10 V at contact 6.

▷ Adjust for f.s.d. with R53.
R60, R61, R62 and R58 determine the voltage division. With R58 the meter is approximately critically damped.

▷ Should it be impossible to adjust for f.s.d. with 53, then replace T14.

5.2.3 RECORD Output

Voltage between Bu22 and Bu23
with f.s.d. on meter J1 ..... 8.7 to 9.2 V

5.3 2nd IF Section

5.3.1 Final Amplifier

Midband frequency and bandwidth

See Fig. 5-3

▷ Measure with sweep generator
Apply swept signal at BU12
(max. EMF = 76 dB (µV), f = 10.7 MHz).

▷ Adjust with C155 and C159 for the passband characteristic shown in Fig. 5-3.

Gain

▷ Apply unmodulated signal from signal generator at BU12.
(EMF = 62 to 66 dB (µV), f = 10.7 MHz).
Indication on I1 ..... f.s.d. (10 V)

▷ Trim with C152. Smaller capacitance provides higher gain and lower bandwidth.
Check bandwidth again after replacement of C152.

Difference between AVERAGE and PEAK indication with f.s.d. and unmodulated sinewave

▷ Measure the difference in reading with a well-defined level applied at BU12 at f.s.d. AVERAGE and PEAK

Permissible difference in reading ..... < 2 dB

It may be preferable to hold the PEAK indication somewhat lower.
Trimming is possible with R144.

5.3.2 AM Demodulator

Demodulation

See Fig. 5-4

▷ Button S4 V at AVERAGE and button S4 III at AM.

▷ Apply amplitude-modulated signal from signal generator at BU12 (f = 10.7 MHz, f_{mod} = 1 kHz, 30% mod. and level for f.s.d. on meter I1). Measure at output (2) of 2nd IF section according to Fig. 5-4.

Adjusting and checking the squelch circuit

(see section 5.3.8)

Difference in reading between AVERAGE and PEAK with [illegible] and AM sinewave signal

▷ Adjust signal generator as above;
reading on I1 with PEAK: f.s.d.

▷ Change to AVERAGE
Reading on I1 ..... ca. 17.7 dB

Checking the AF amplifier

See Fig. 5-5

▷ Button S4 V at AVERAGE; R158 ⌒ at mid-position; measure with AC voltmeter at BU19 ⊣ and terminate BU19 with 15-Ω resistor.

▷ Apply modulated signal from signal generator at BU12 (f = 10.7 MHz, f_{mod} = 1 kHz, 30% mod. and level for f.s.d. on meter I1).

▷ E_{rms} at BU19 ..... ca. 1.4 V

5.3.3 FM Demodulator

See Fig. 5-6

▷ Button S4 III at FM and button S4 V at AVERAGE.

▷ Apply FM signal at BU12 (f = 10.7 MHz, f_{mod} = 1 kHz, Δf = 65 kHz and level for f.s.d. on I1).

▷ Adjust C180 according to Fig. 5-6 (measure at output (4) of 2nd IF section).

▷ Check with Δf = 40 kHz. $E_{pp} \approx 1.75$ V.

5.3.4 Tuning Indication

See Fig. 5-7

▷ Apply unmodulated sinewave signal at BU12 (f = 10.700 MHz and level for f.s.d. on I1).

▷ Adjust with R63 for mid-scale deflection of I2 (tuning indicator).

▷ Check without signal:
Indication of I2 should be at mid-scale. If necessary, C180 may be slightly adjusted. Then check according to 5.3.3.
When the adjustment of the HFV (with RF Plug-in) is completed, the indication of meter I2 must be mid-scale if the input is terminated.

5.3.5 Log. IF Amplifier

See Fig. 5-8

Adjustment of bandpass characteristic

▷ Only button S4 VIII depressed (⊙).
Measure control voltage at C148 with high-impedance voltmeter and preset to minimum with R135.

▷ Disconnect operating voltage for T17 to T20 at C143.
Adjust with C129 and C137 according to Fig. 5-8.
If bandwidth too low, coils L58 and L60 may be damped by connecting a resistor in parallel.

Gain adjustment

▷ Connect BU12 again to ST12.
Apply unmodulated signal from signal generator at BU17.
(EMF = 70 dB (µV), f = 10.7 MHz).
Should overall gain margin according to section 5.3.7 be insufficient, a slightly lower signal generator level may be used.

▷ Adjust R135 for f.s.d. on meter I1.

▷ Resolder supply lead to C143.

5.3.6 Preamplifier and Crystal Filter

See Fig. 5-9

Adjusting the bandpass characteristic

▷ Measure with sweep generator (narrowband sweep oscillator).
R160 CALIB at mid-position; attenuator S1/S6 at 0 dB.

▷ Adjust with
C105 and C117 for maximum
C108 and C114 for minimum ripple.

▷ Attenuator S1/S6 at +10 dB:
Correct if necessary with C108 and C117.

Range switching from 0 to +10 dB

▷ Test setup as above and attenuator S1/S6 at 0 dB. Mark the level with the level reference line.

▷ Attenuator S1/S6 at +10 dB; increase level at ST11 by 10 dB.
Select R205 such that passband characteristic corresponds on average to that obtained with 0 dB.

Adjustment range of R160 CALIB.

▷ Test setup as above and R160 CALIB. at right stop.
Mark the level with the level reference line.

▷ R160 CALIB at left stop; increase signal level at ST11 by 20 dB; select R161 such that the level corresponds to the reference line adjusted before.
Permissible deviation from 20 dB ..... -1 to +2 dB

Note:
If the value found for R161 is much lower than usual, the control ranges of T17 and T18 should be determined separately. If the MOS-FET's are defective, the gain may be satisfactory but the possible control range be only a few dB.

Gain between ST11 and ST17
See Fig. 5-10

▷ Apply signal from signal generator at ST11 (EMF = 46 dB (µV), f = 10.7 MHz). R160 CALIB at right stop and attenuator S1/S6 at 0 dB.

▷ Measure with RF voltmeter at ST17.
E_{rms} at ST17 ..... ca.43 mV.

5.3.7 Overall Adjustment of 2nd IF

Adjusting the passband characteristic

See Fig. 5-11

▷ Measure with sweep generator (narrowband sweep oscillator 9.5 to 12.5 MHz) R160 CALIB at mid-position and attenuator S1/S6 at +10 dB.
Prior to this adjustment the passband of the preamplifier must have been correctly adjusted according to section 5.3.6.

▷ Adjust with C129 and C137 for horizontal passband curve according to Fig. 5-11.

Adjusting the control voltage for the log. IF amplifier

See Fig. 5-12

▷ Apply signal from signal generator to ST11 via attenuator set (EMF = 86 dB (µV), f = 10.7 MHz).
Attenuation of attenuator set
with LIN f.s.d. ..... 50 dB
with LOG f.s.d. ..... 10 dB
Adjust R160 CALIB for f.s.d. with LIN (≈ mid-position) and attenuator S1/S6 at +10 dB.

▷ With LIN f.s.d. AVERAGE and PEAK indication must agree.

▷ Switch to LOG/AVERAGE indication.
Attenuator set at 10 dB.
Adjust with R152 for f.s.d. 60 dB.

▷ Switch to LOG/PEAK indication.
Adjust with R148 for f.s.d. 60 dB.

Measuring the gain margin beyond f.s.d. of I1

See Fig. 5-13

▷ Apply signal from signal generator at ST11.
R160 CALIB at right stop and attenuator S1/S6 at 0 dB.
LIN AVERAGE indication.
Adjust signal generator level for f.s.d. on I1.
Determine gain margin by formula:

$$\frac{\text{Gain margin}}{\text{dB}} = 26 \text{ dB } (\mu\text{V}) - \frac{\text{sig. gen. level (EMF)}}{\text{dB } (\mu\text{V})}$$

Nominal ..... 12 dB ±1.5 dB

Measuring the linearity margin

See Fig. 5-14

▷ Adjust R160 CALIB to -10 dB below maximum gain;
ST17 open. Adjust signal generator level for f.s.d. on I1.
Terminate ST17 with 50 Ω and connect RF microvoltmeter in parallel.
(indication of I1 decreases).

▷ Note voltmeter indication. Increase level at ST11 until voltmeter reading falls short by 1 dB of the linear increase (1 dB compression).

▷ The required increase of input level is the linearity margin.

Nominal ..... 45 ±2 dB

5.3.8 Adjusting and Checking the Squelch Circuit

(Together with 2nd IF section, AF and meter amplifier and meter J1)

▷ Button S4/II (SQUELCH) depressed.

5.3.8.1 Zero Setting

▷ Adjust on squelch board 204.1632 for minimum:
Gate of T1 at chassis.

▷ Unsolder lead at contact 2 of squelch board and connect contact 2 to chassis.

▷ Vary R11 such that the relay switches on; then adjust R11 such that the relay just switches off.

5.3.8.2 Checking Adjustment Range of Switching Threshold

▷ Resolder lead to contact 2.

▷ Apply unmodulated 10.7-MHz signal of variable level to ST11.

▷ a) Set R5 for minimum (Gate of T1 at chassis). AF is switched on with indication < -3 dB on scale II (log. scale) of meter J1.

b) Set R5 for maximum.
AF is switched on with indication > 30 dB on log. scale of meter J1.

▷ Hysteresis between switch-off and switch-on points with unchanged setting of R5... about 2 - 4 dB on log. scale.

5.4 RF Section

Repair of the RF section should normally be made at the R&S factory because of the difficult work involved.

5.4.1 2nd Oscillator and Mixer

Oscillator adjustment

See Fig. 5-15

▷ Connect spectrum analyzer at ST10.
Adjust C72, C81, C84, C87 and C88 for maximum amplitude at 410.7 MHz.

▷ The spectral lines at 342.25 MHz and 479.15 MHz (4th and 6th harmonics of crystal frequency) must be > 70 dB attenuated as against 410.7 MHz.

This ratio must be obtainable by slight correction of C81 and C84 without loss in the maximum level at 410.7 MHz.

▷ The oscillator must operate immediately and reliably when the operating voltage is switched off and on again.

▷ Clear oscillations must be observed on the screen.
If the cover at the side of the crystal oscillator is opened, the oscillations must not break down and no parasitic oscillations must occur.

▷ Measure the oscillator frequency with a counter.

Nominal ..... 410.7 MHz ±5 kHz

Checking the mixer

▷ Measure the voltage drop at R1 with a DC voltmeter at check point MP of the mixer Y5.

▷ Diode current ..... 10 +2 mA corresponding to 47 ±9.4 mV

5.4.2 1st Oscillator, Mixer and Oscillator Output (Checks)

Modifications to the 1st oscillator and the associated mixer usually require recalibration of the tuning scale.

▷ Measure the supply current while tuning through the oscillator.

I_o ..... < 25 mA

▷ Measure the mixer current at MP (voltage drop across 4.7 Ω).

I_M ..... 6.8 to 16 mA corresponding to 32 to 75 mV

▷ Measure the oscillator frequency with a counter at the osc. outp. Bu26

f_o ..... 422 to 710 MHz

The oscillator frequency changes slightly upon connection of a counter.

▷ Measure the voltage at the oscillator output Bu26 (Fig. 3-3)

E_{out} ..... ca. 40 mV

Condition for satisfactory functioning of AFC:

Check frequency variation due to base voltage variation at T5 (see Fig. 5-26)

Insert decade resistor between D1 of 1st oscillator and point 8 on board 203.6276.

Decade resistor 0 Ω ⟶ 100 Ω: frequency variation always negative and > 500 kHz

Decade resistor 100 Ω ⟶ 300 Ω: frequency variation remains negative.

5.4.3 Overall Adjustment of 1st IF

See Fig. 5-16

5.4.3.1 Gain and Image Frequency Rejection

Note:

The value of R24 (82 kΩ ±20 kΩ) has been determined in the test department; it can be used to vary gain and current drain of transistor T12 and noise figure.

▷ Connect signal generator to ST7 (level 1 µV into 50 Ω, f = 100 MHz).

Tune 1st oscillator for reception.

Trim L25, C40 and C42 for max. amplitude.

Gain between ST7 and BU11 ..... 0 dB $^{+2}_{-0.5}$ dB

▷ Apply 78.6 MHz (level 10 mV into 50 Ω) from signal generator.

Do not detune 1st oscillator.

Trim C49 and C50 for minimum at 78.6 MHz.

Image frequency rejection ..... > 80 dB

▷ Apply signal of f = 100 MHz (any level) from signal generator.

Note indication on meter I1.

Slightly vary C49 and C50 for maximum indication.

Variation of indication ..... < 0.5 dB

Should the indication vary more, repeat the first two steps.

5.4.3.2 Adjusting the 400-MHz Trap

▷ Apply signal of f = 400 MHz and 100 µV into 50 Ω from signal generator.

Trim coil L24 for minimum indication at 400 Hz by bending with a perspex rod (2 mm dia). (L24 must lie in the middle of the compartment).

1st IF rejection ..... > 30 dB.

L24 is accessible through a hole.

5.4.3.3 Noise Adjustment

▷ Connect noise generator at ST7 and measure with HFH at BU11.

▷ Adjust noise figure with L25, C40, C42 at f = 25 to 300 MHz.

Noise figure ..... < 8

5.4.3.4 10.7-MHz IF Rejection (only with bandpass filter 203.8027)

▷ Apply signal of f = 10.7 MHz to ST5 from signal generator and adjust level to 10 mV into 50 Ω.

▷ IF rejection ..... > 80 dB

5.4.4 Adjusting the Bandpass Filter

See Figs. 5-17 and 5-18

▷ Measure with sweep generator at ST6.

▷ Adjust by bending L15 to L21.

Attenuation curve according to Fig. 5-18:

Insertion loss in range 25 to 300 MHz ..... < 1 dB

Ripple in range 25 to 300 MHz ..... < ±0.5 dB

Attenuation

at 10.7 MHz ..... > 70 dB

at 400 MHz ..... > 33 dB

at 825 to 1100 MHz ..... > 70 dB

5.4.5 Checking the Attenuator Switch

Attenuation:

See Fig. 5-19 Test frequencies : 100 and 300 MHz

Attenuator error

up to 60 dB ..... < ±0.3 dB

up to 70 dB ..... < ±0.5 dB

Characteristic impedance ..... 50 Ω

Reflection coefficient

See Fig. 5-20

▷ Check with reflectometer at attenuations 0, +10, +20 and +30 dB and frequencies 100, 250 and 300 MHz.

▷ Permissible reflection coefficient
measured into input ..... < 5%
measured into output ..... < 5%

▷ Should the attenuator switch be defective, it must be returned to the R&S factory for repair.

5.4.6 Adjusting the AFC

▷ Apply 100-MHz signal to RF input Bu1.
Signal generator EMF: ca. 26 dB (µV)
Tune HFV for mid-scale deflection on J2.

▷ Depress button AFC (S4IV).
J2 should again indicate mid-scale.
Adjust with R1 on AFC board Y10 (204.2316).

Check the holding range in the whole frequency range 25 to 300 MHz:

▷ Tune HFV to input signal

▷ Depress AFC button.
Indication of J2 at mid-scale.

▷ Detune signal generator; holding range should be $\geq \pm 500$ kHz and approximately symmetrical.
Improvement of symmetry is possible with R10.

5.5 Checking the Scale

Adjust the mechanical zero.
With the RF section adjusted

5.5.1 Checking the IF Passband Characteristic (Fig. 5-22)

▷ Tune receiver to 100 MHz.

▷ Apply 100-MHz swept signal at BU1.
R160 CALIB at mid-position and attenuator S1/S6 at +10 dB.
S4IV at LIN.

▷ Measure with sweep generator at BU15.
Adjust passband characteristic with C105 for 1 dB ripple.

5.5.2 Scale LIN. AVERAGE

See Fig. 5-23

▷ Apply 100-MHz signal at BU1 via external attenuator set.
EMF of signal generator: 46 dB (µV).
Attenuator S1/S6 at +10 dB and ext. attenuator set at 10 dB.
S4IV at LIN.

▷ Adjust R160 CALIB for f.s.d. on I1.
Increase attenuation of ext. attenuator set in 1-dB steps and check scale.

5.5.3 Scale LOG. AVERAGE

▷ Test setup as for 5.5.2, but S4IV at LOG.
Do not change setting of R160 CALIB.
Ext. attenuator set at 10 dB.

▷ Signal generator EMF: 86 dB (µV) at BU1.
Adjust indication on I1 with R152 to f.s.d.

▷ Check scale in 10-dB steps.

5.5.4 Checking the BATT. Scale Mark

▷ Unsolder lead at point 25 of circuit board 204.1110+)
Connect DC voltage source at point 25.
Meter indication with
+11.85 V at point 25 ..... approx. low end of mark
+14.5 V at point 25 ..... approx. high end of mark

5.6 Pulse Generator

Because of the difficult work involved, the pulse generator should normally be sent to the R&S factory for repair. The adjustment requires in addition to conventional measuring equipment the following instruments, which are seldom available in workshops:

+) With series M 1958/1 to 50 circuit board 203.8210; connect DC source to point 12.

- Sampling oscilloscope
- Spectrum analyzer with storage tube

For accurate data see section 3.1.
The following instructions are given only for the case that return to the R&S works should be impossible.

5.6.1 Adjustment for Time Domain

▷ Checking the supply voltage:
C10 to ⊥ ..... 9.00 ±0.05 V
Current drain ..... ca. 30 mA

▷ Potentiometer presetting:
R3 and R6 at mid-position;
R8 at left stop.

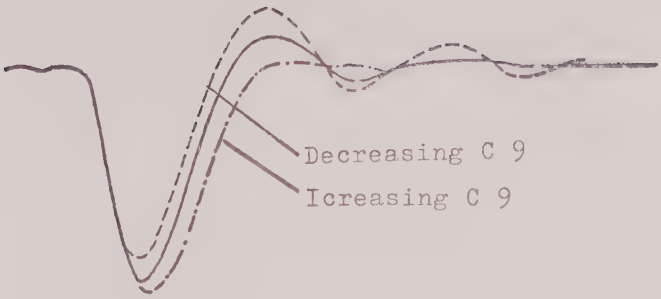
▷ Connect oscilloscope via 1:1 probe to test output C11 (sensitivity 1 V/cm).
Check timebase of oscilloscope.
Preset PRF to 100 Hz using R6 according to Fig. 5-24.9.

▷ Check the driving pulse according to Figs. 5-24.1 to 5-24.9.

Note:
Only the rise time of the driving pulse is important, not the pulse width.
Pulse width should be kept small to keep the power consumption of the final transistor T3 as low as possible.

▷ Connect sampling oscilloscope to output ST4.
Check output pulse according to Figs. 5-24.10 to 5-24.12.

▷ Adjustment
R8 for ..... max. pulse amplitude
R3 for ..... max. pulse amplitude
Repeat adjustments of R8 and R3 several times alternately.
C9 affects the spectrum of the output pulse.
It can be seen from the overshoot of the pulse whether the spectrum falls or rises at high frequencies.



Heavy overshoot indicates a rising spectrum.

5.6.2 Checking the Output Spectrum

A spectrum analyzer with storage tube is required to display the output spectrum. It is connected with a short cable to the output SI4.

HF Spectrum Analyzer 141 T was used to take the photographs Figs. 5-24.13 and 5-24.14.

The main settings are:

IF bandwidth	100 kHz
Scan Width/div.	50 MHz for entire frequency range 0 to 300 MHz
	5 MHz for frequency range 0 to 50 MHz
Display	linear
Sensitivity	10 µV/div.
Scan-Time/div.	5 sec

The display can be varied in 1-dB steps with the IF gain knob. Thus the picket-fence effect of the spectrum can be determined. Prior to the measurement the frequency response of the analyzer should be measured with the aid of a signal generator.

Noise is suppressed by means of the base-line clipper. Adjust C9 such that the spectrum is as constant as possible in the frequency range 25 to 300 MHz.

5.6.3 Adjusting the 400-MHz Trap

See Fig. 5-25

▷ Measure with a sweep generator.

▷ Trim the trap to 400 MHz by bending L4.
Required attenuation ..... > 15 dB.

5.6.4 Adjusting the Pulse Generator Level

5.6.4.1 Level Difference Sinewave/Pulse Signal

▷ Test setup acc. to Fig. 5-23
LIN. AVERAGE indication, attenuator S1/S6 at +10 dB
adjust R160 CALIB for f.s.d. on I1 with internal pulse generator (CALIB) switched on.

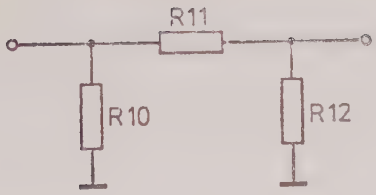
▷ Measure difference of indication from sinewave signal with EMF = 36 dB (µV) using signal generator with Z_{out} = 50 Ω. Adjust frequency to a particular (mean) point of the passband characteristic (e.g. mid-position of tuning indicator for instruments with FNr. M 2071/1 and higher).

Note:
Adjust signal-generator level using power meter and attenuator set.

Determine the differences every 10 MHz from 25 to 60 MHz and every 25 MHz from 75 to 300 MHz.
With rising or falling spectra correct the setting of C9 according to section 5.6.1. Determine the differences anew whenever C9 has been varied.
If the difference is approximately the same in the whole frequency range, adjust the pulse generator according to 5.6.4.2.

5.6.4.2 Adjusting the Pulse Generator Level

The required increase or decrease of the pulse generator level is obtained according to section 5.6.4.1. The following table shows attenuations for different combinations of resistors R10, R11 and R12.



R10 = R12

R10 = R12 Ω	R11 +) Ω	a dB	/r/ %	Z Ω
120	47	7.47	1.4	48.7
120	56	8.09	2.2	52.2
100	56	8.89	2.9	47.2
100	68	9.54	0.2	50.1
100	82	10.5	3.9	54.0
82	82	11.3	2.7	47.4
82	100	12.4	0.4	50.4

Other values can be calculated by:

$$Z = \frac{R10}{\sqrt{1 + \frac{2\,R10}{R11}}}$$

$$\frac{a}{(dB)} = 20 \lg \frac{R10 + Z}{R10 - Z}$$

$$\frac{/r/}{\%} = \frac{R - Z}{R + Z} \cdot 100 \text{ (with } R = 50\ \Omega)$$

Find the resistance values in this table and make sure that the reflection coefficient is as low as possible. Repeat the measurements according to section 5.6.4.1 after incorporating in the HFV.

+) In the instruments of series M 1958/1 to 50, R11 is divided into R11 and R16. In this table R11 stands for R11 + R16.

5.6.4.3 Checking the CHECK Mark

▷ Buttons S4 VI CALIB and S5 CHECK depressed.

▷ Indicated value ..... in narrow blue range above scale III

5.7 Mechanical Work

5.7.1 Removing the Subassemblies and Components Fixed to the Front Panel

See Figs. 4-3 and 4-4.

The parts fixed to the front panel are accessible only when the instrument is removed from its cabinet (the front-panel cover must be removed before).

After loosening the four Phillips screws on the front panel, the instrument can be taken out. Release the operating knobs with the aid of a 2-mm set-screw wrench; the cover plate can then be removed.

5.7.1.1 Removing the RF Section

Remove the three countersunk screws and disconnect the supply leads 9 V and 12.5 V and the RF cables K4, K9 and K11. The complete RF section can then be taken out. Only then can the cap protecting the selective circuits be removed. The covers of the 1st oscillator and 1st IF section can be taken off after loosening the corresponding screws. The RF connections at the rear of the 1st IF section, 1st oscillator and bandpass filter are accessible after the 1st IF section has been taken out by turning about the bolt at the end of the supporting panel of the RF drive. The trimming points are identified.

5.7.1.2 Removing the Attenuator Switch

Fixed centrally to the front panel. Remove RF cables K2 and K3; unsolder leads at the double switch deck under the attenuator switch.

The cover can be taken off after loosening three screws so that individual resistors can be changed. The double switch deck S6 may remain on the cover.

When reassembling take care to arrange S1 and S6 correctly.

5.7.1.3 Removing the Meters

Each meter is secured to the front panel with two screws.

5.7.1.4 Removing the CHECK Button

Fixed centrally to the front panel.
This double switch is best accessible after removal of the RF attenuator switch.

5.7.1.5 POWER Glow Lamp

Can be removed by pressing from the inner side of the front panel.

5.7.1.6 Pushbutton Assembly

This need not normally be taken out because all leads are accessible from the front. Replacement of the pushbutton assembly can best be carried out together with pushbutton board.

5.7.2 Removing the Parts Fixed to the Frame

See Figs. 4-3 and 4-4.

5.7.2.1 Power Supply

Unfasten the power plug, AC supply filter, fuse holder, voltage selector and power transformer.

To remove the rectifier and stabilizer board 203.8010 or 204.1110+) proceed in the following order:

- ▷ Unsolder cable harness and connections to power transformer (K1 13 and 14).
- ▷ Detach the subassembly from the case (fixed with two countersunk screws at the bottom).
- ▷ Unscrew and unsolder electrolytic capacitor C212 (500 µF).
- ▷ Unscrew and unsolder series transistor T34.
- ▷ Loosen the screws uniting the circuit board to the cooling plate, remove the screws of the integrated regulator B4 and remove cooling plate. It will be difficult to unsolder B4 from the double-faced board 203.8210 or 204.1110.

+) For series M 2071 and higher

5.7.2.2 2nd IF Section

The adjustable IF amplifier and the log. amplifier are at the rear (T17 to T28), the final amplifier and the demodulators at the front (B2, B3, T30).

The final amplifier and the demodulators are accessible from outside when the cover is removed. The trimming potentiometers are accessible through holes.

The adjustable IF amplifier and the log. amplifier can be made accessible as follows:

- ▷ Separate the connection BU11-ST11.
- ▷ Open the retaining spring and swing the whole IF section out. The trimming points are then accessible.
- ▷ To gain access to other components of these amplifiers, remove the rear cover.
- ▷ If any components are to be replaced, unsolder choke L62 from feed-through capacitor C149, remove the four screws on the top and at the bottom and separate the two sections of the IF section.
  The intermediate cover can then be removed and the components are accessible from both sides.

5.7.2.3 Meter and AF Amplifier

Subassembly 203.7995 can be removed after loosening of three screws.

5.7.2.4 Loudspeaker

The loudspeaker is shock-mounted with four screws and can be removed by loosening the screws.

5.7.2.5 2nd Oscillator

Fixed with a spring. The components are accessible when the cover is removed.

5.7.2.6 Pulse Generator

Fixed with a spring. The double-faced board is accessible on both sides when the cover is removed.

5.7.2.7 Squelch Board Y9

The squelch board is screwed to a plate which is fixed to the right-hand side wall.
To remove the board, remove Bu16 and unsolder the AF cables K90 and K91.

5.7.2.8 AFC Board Y10

The AFC board is fixed to the supporting plate of the RF section with a bracket. For removal, unscrew the plate and unsolder the leads.

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Bilder
Figures

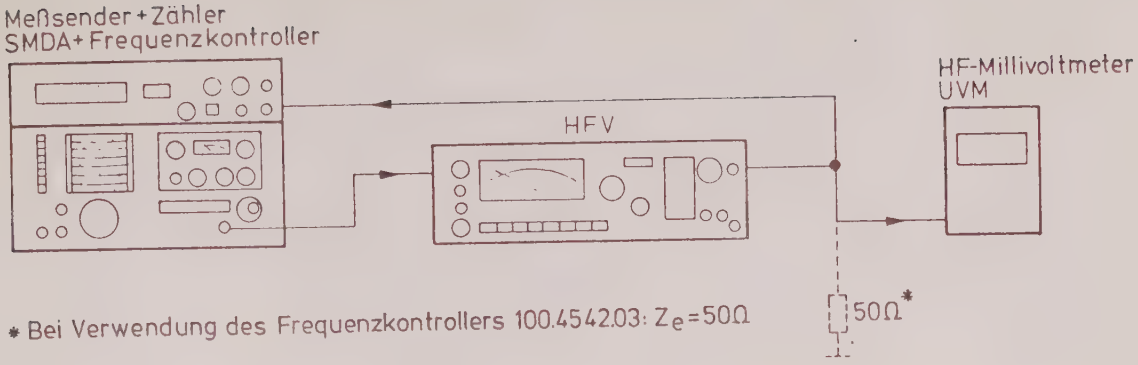


Bild 3-1: Meßaufbau zur Prüfung von ZF-Durchlaßkurve, ZF-Ausgangspegel und Abstimmanzeige

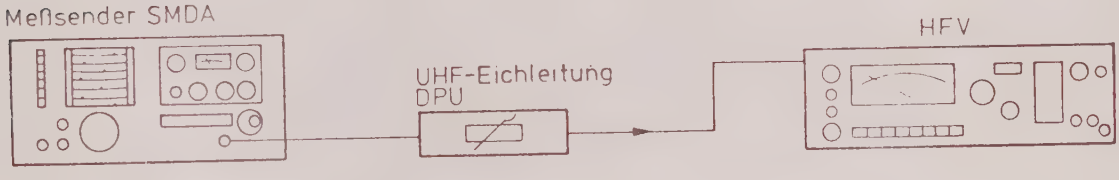


Bild 3-2: Meßaufbau zur Prüfung des Pegelschalters

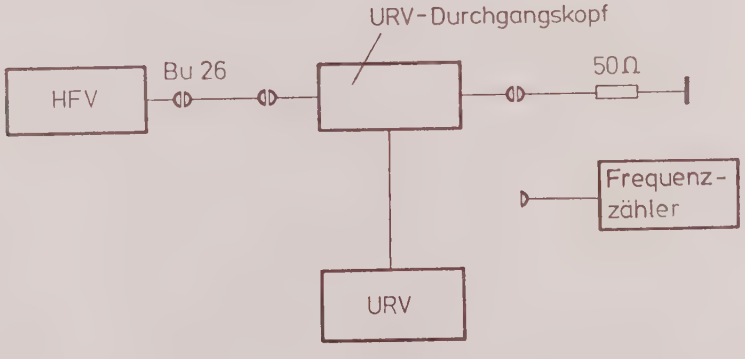


Bild 3-3: Messung von Spannung und Frequenz am Oszillatorausgang

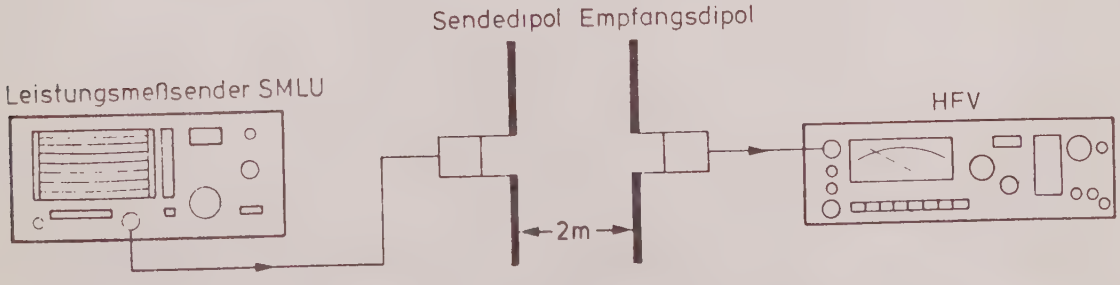


Bild 3-4 Meßaufbau zur Prüfung der HF-Dichtigkeit und des Antennenfaktors

3-1
3-2
3-3
3-4

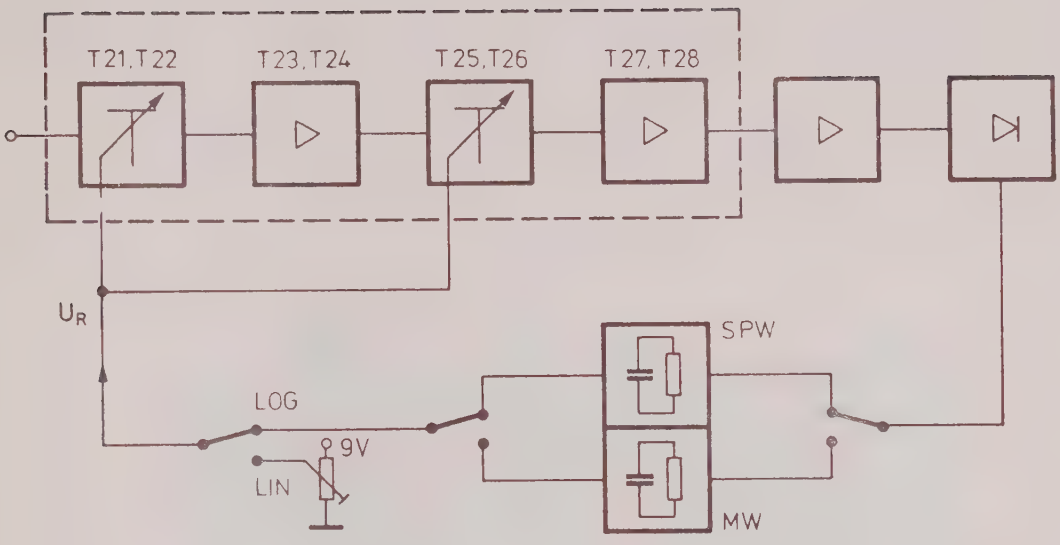


Bild 4-1 Funktionsprinzip des Log. ZF-Verstärkers

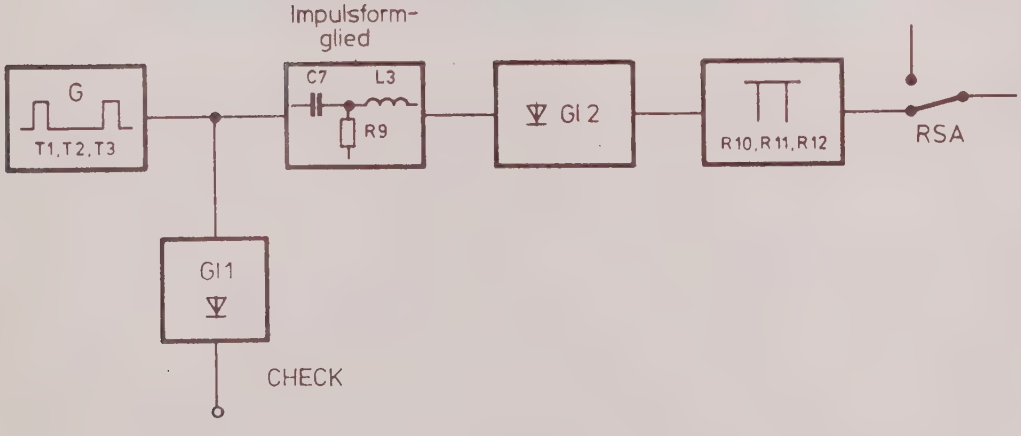


Bild 4-2: Funktionsprinzip des Pulsgenerators

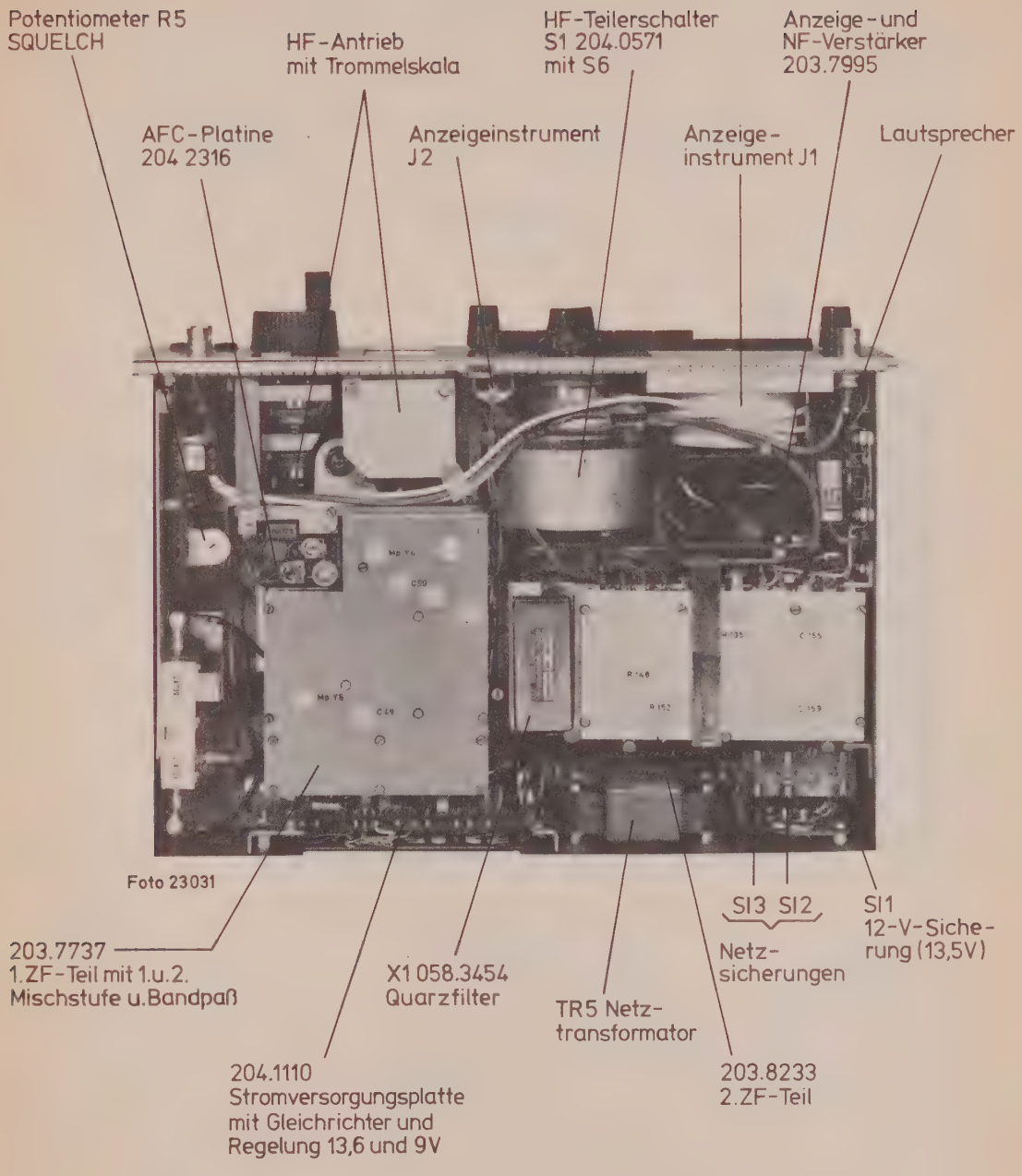


Bild 4-3 : Mechanischer Aufbau (Ansicht von unten)

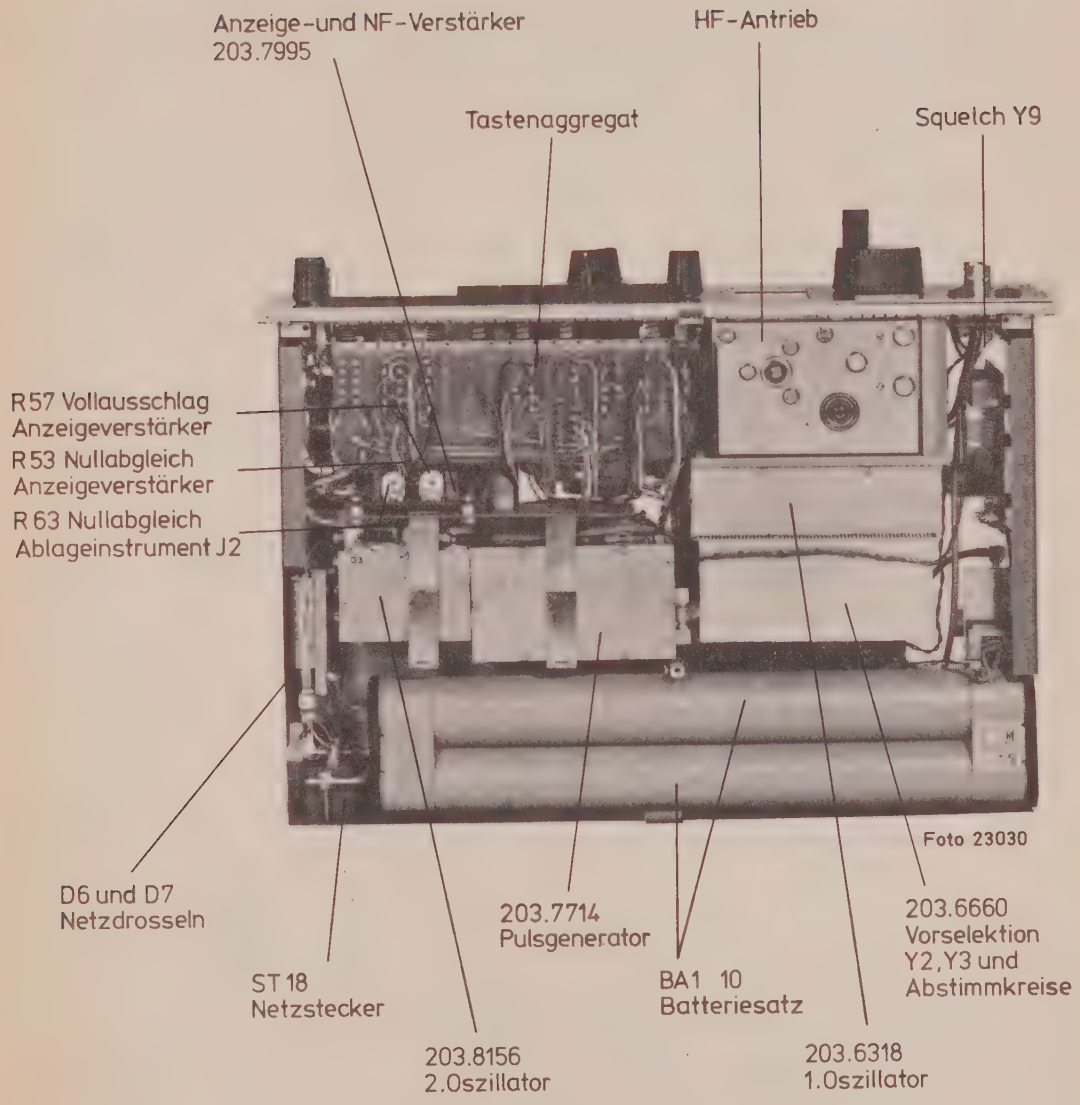
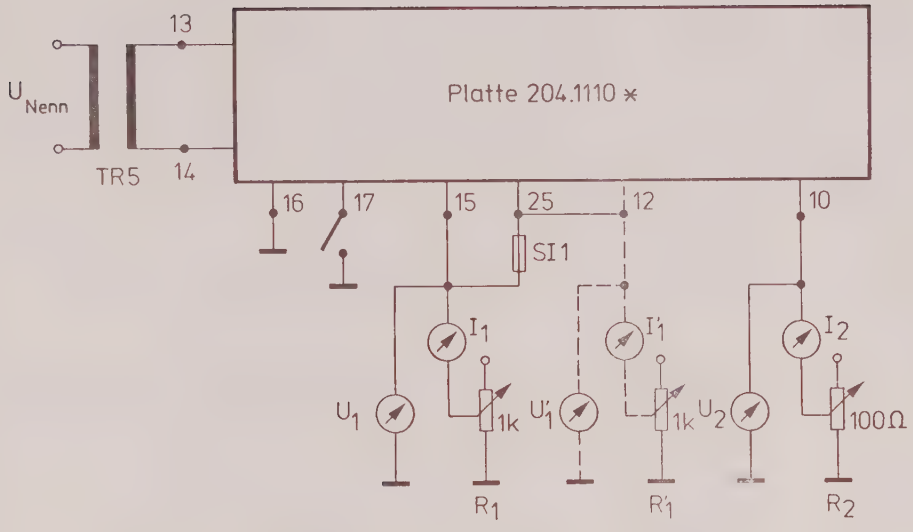


Bild 4-4: Mechanischer Aufbau (Ansicht von unten, Deckblech entfernt)



Leitungen an den Stützpunkten 12 und 10 ablöten und einstellbare Belastungswiderstände laut obigem Meßaufbau anschließen.

Bild 5-1: Meßaufbau zum Prüfen und Abgleichen der Stromversorgung

*) Bei den Geräten M 1958 / : 203.8210 Pkt. 25 nicht enthalten.

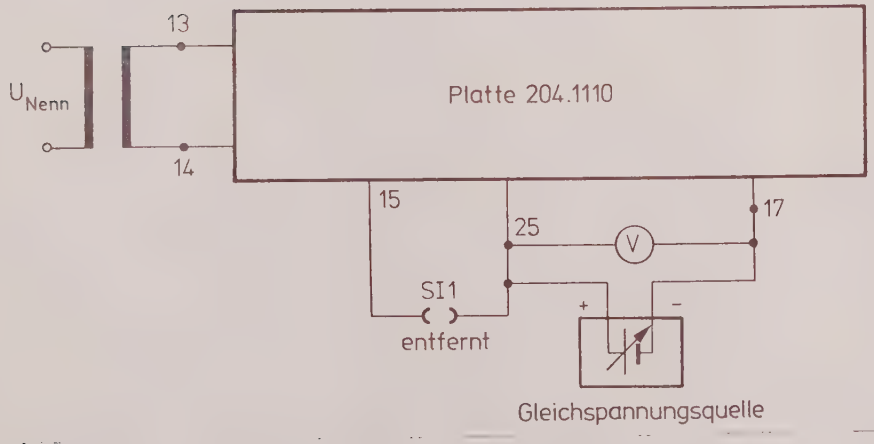


Bild 5-2: Meßaufbau zum Einstellen des Abschaltpunktes der Batterie-Unterentladungssicherung

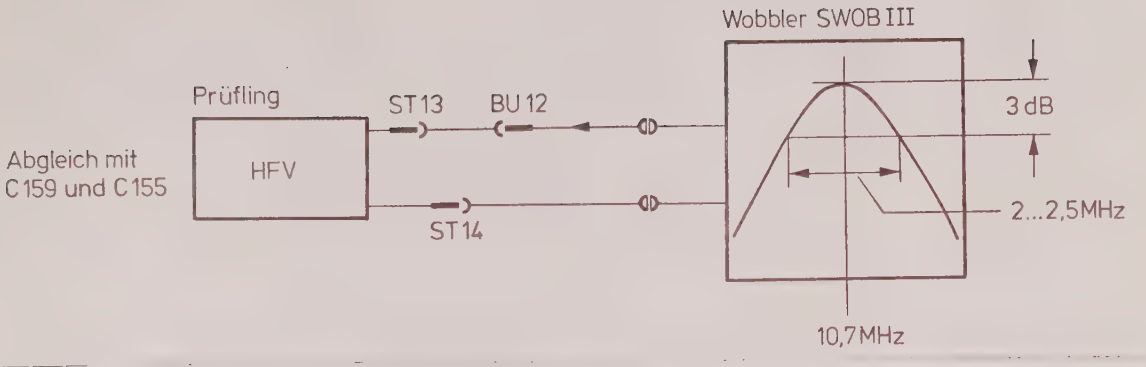


Bild 5-3: Abgleich des Endverstärkers

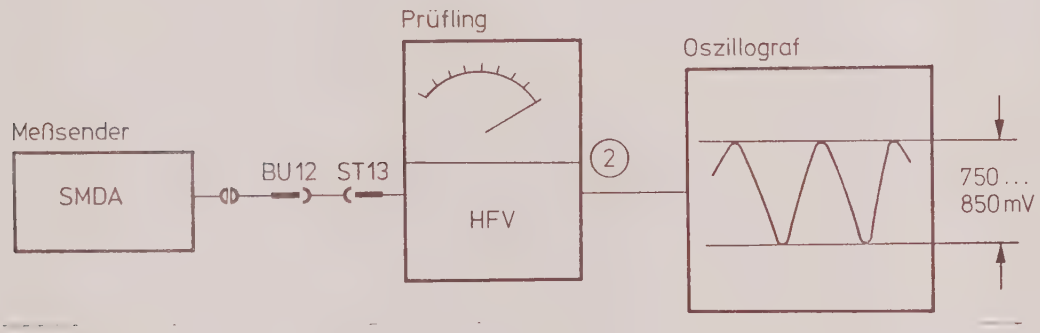


Bild 5-4: Prüfung der AM-Demodulation

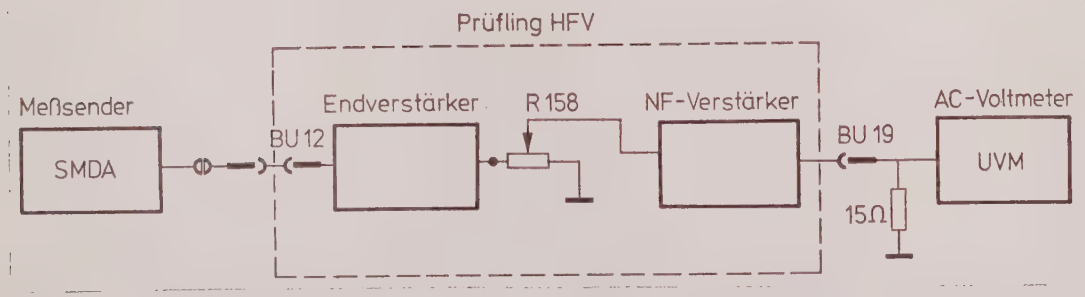


Bild 5-5: Kontrolle des NF-Verstärkers

5-3
5-4
5-5

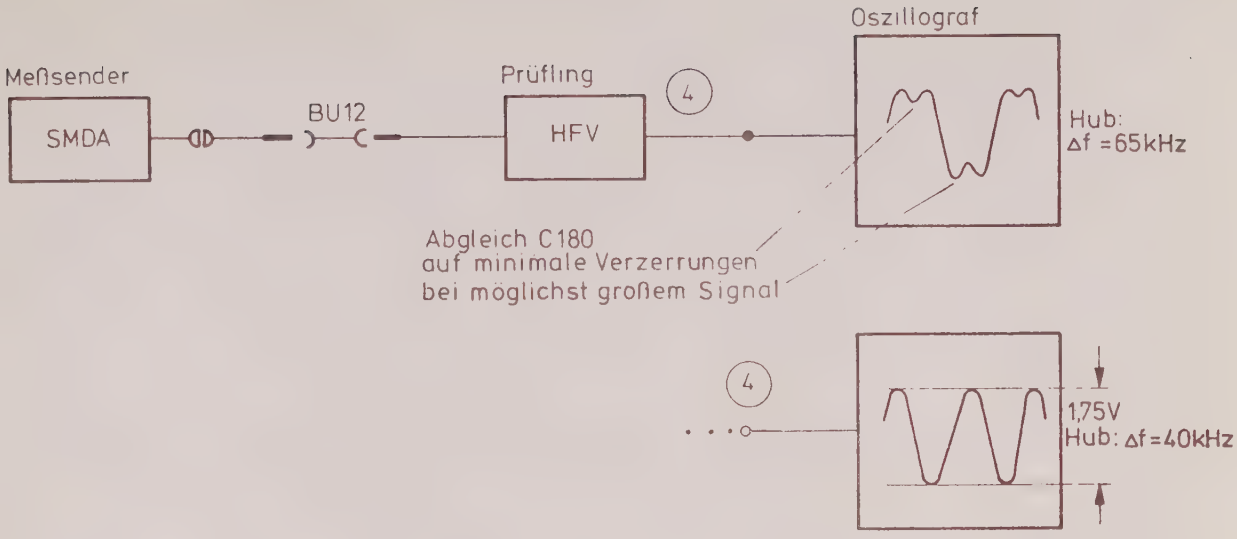


Bild 5-6: Abgleich des FM-Demodulators

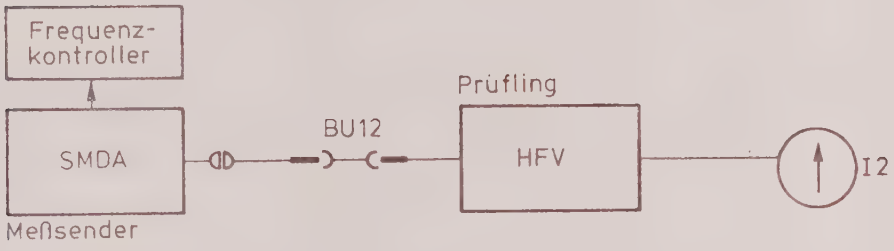


Bild 5-7: Einstellung der Abstimmanzeige

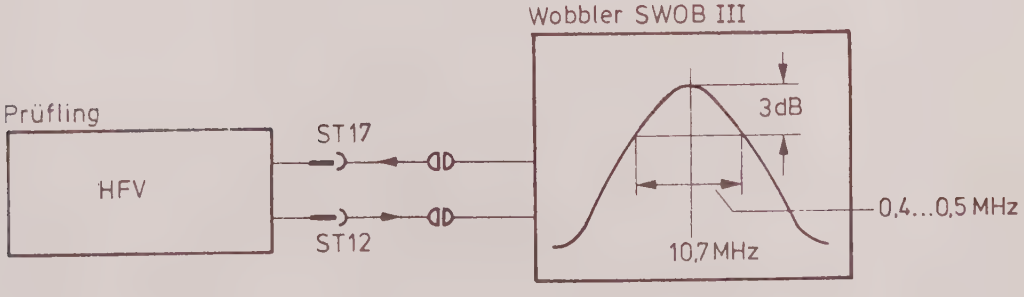


Bild 5-8: Log. ZF-Verstärker

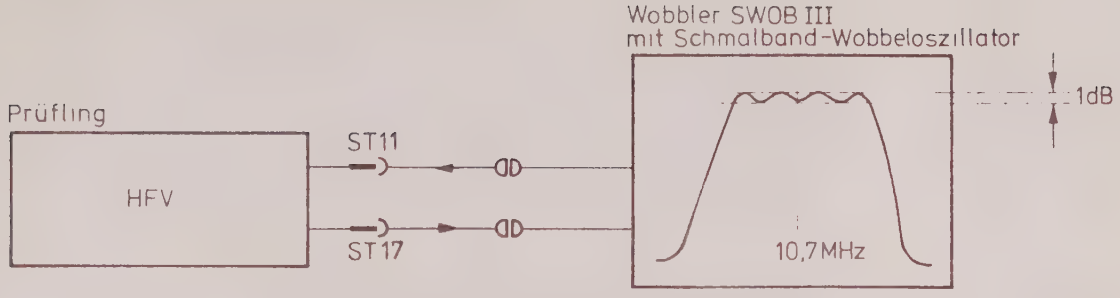


Bild 5-9: Abgleich des Vorverstärkers und des Quarzfilters

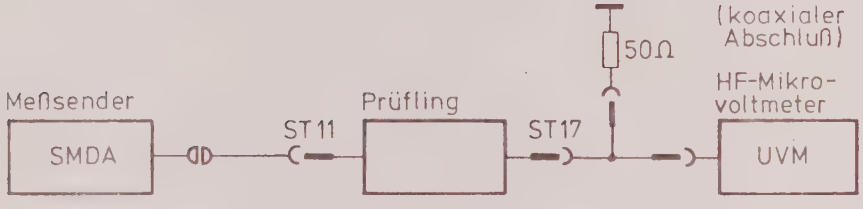


Bild 5-10: Prüfen der Verstärkung zwischen ST 11 und ST 17.

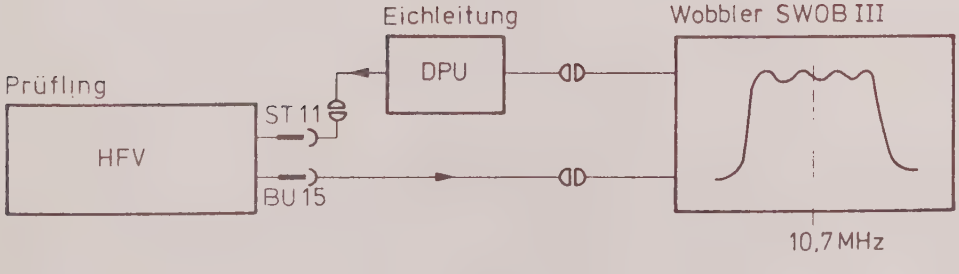


Bild 5-11: Durchlaßkurve der 2. ZF

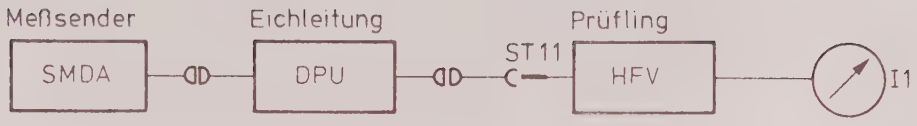


Bild 5-12: Abgleich der Regelspannung des Log. ZF-Verstärkers

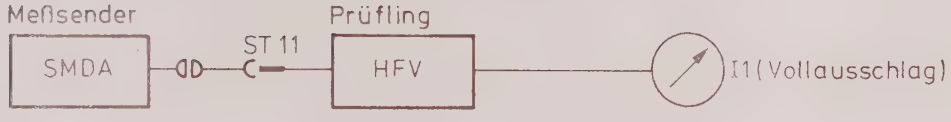


Bild 5-13: Prüfung der Verstärkungsreserve

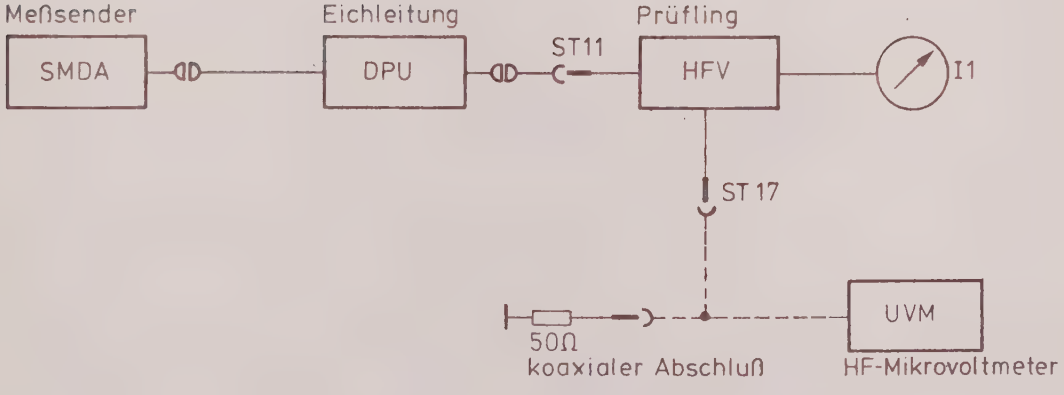


Bild 5-14: Messung der Linearitätsreserve

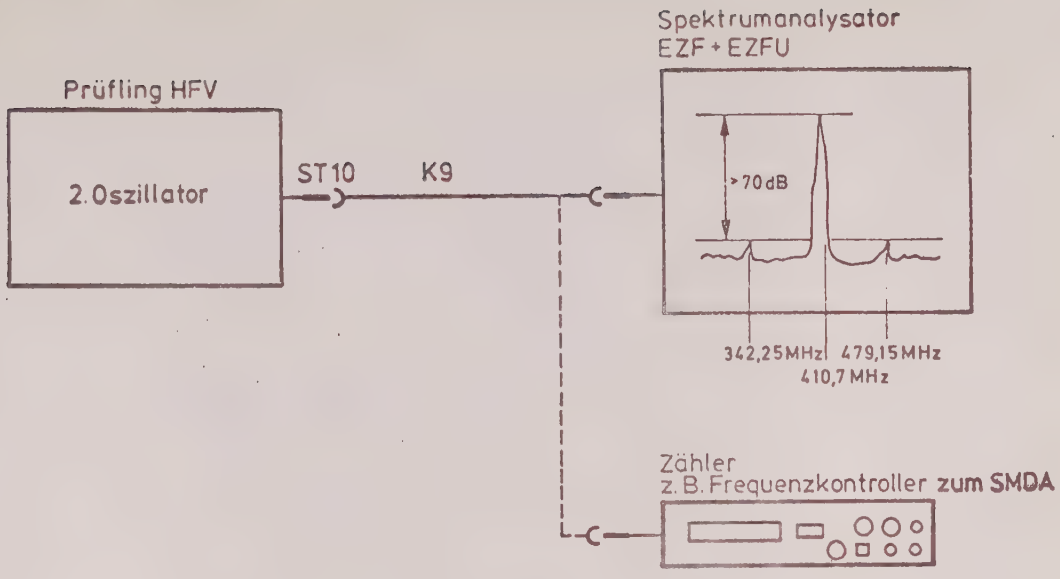


Bild 5-15: Abgleich des 2. Oszillators

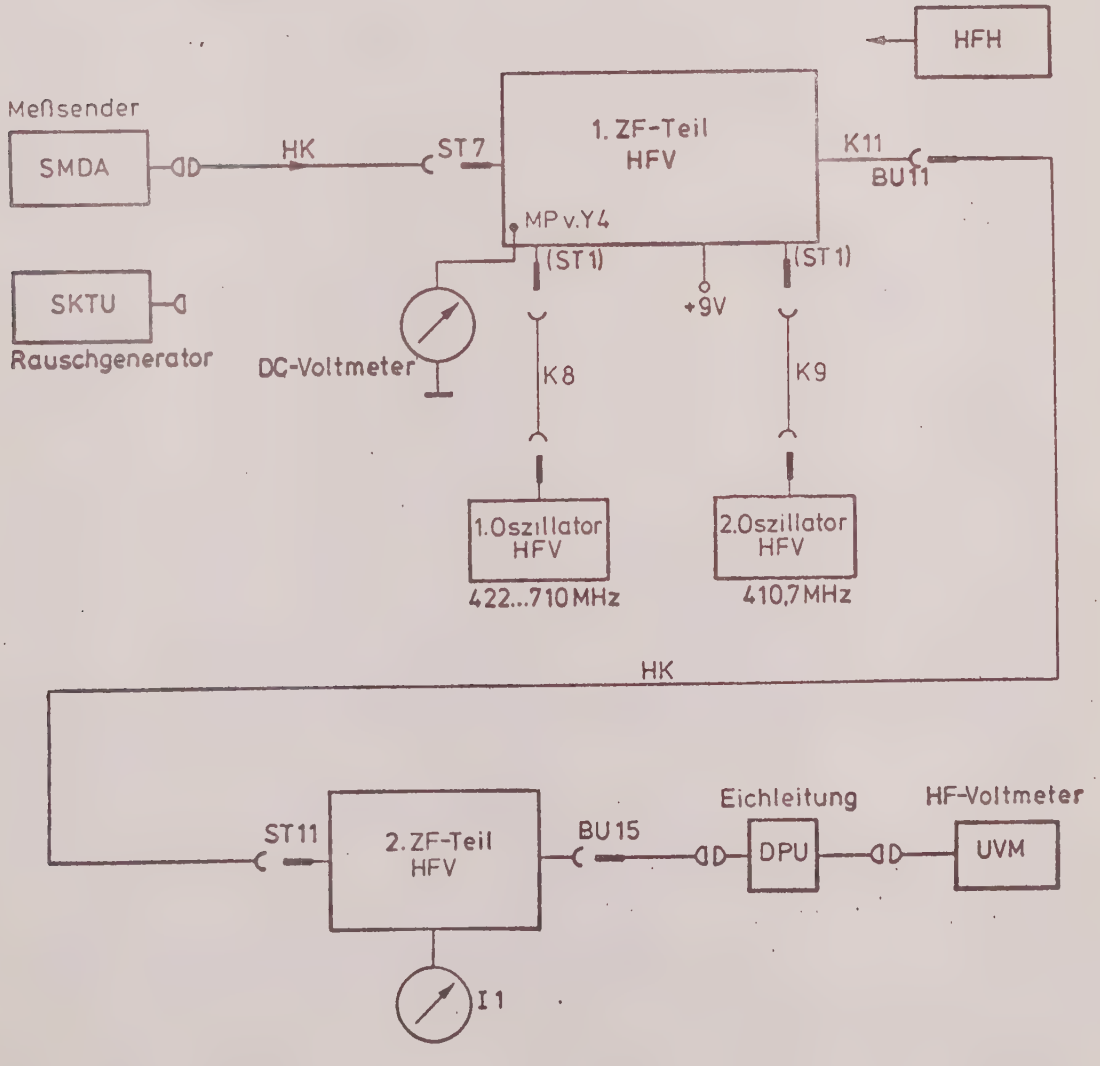


Bild 5-16: Gesamtabgleich der 1. ZF

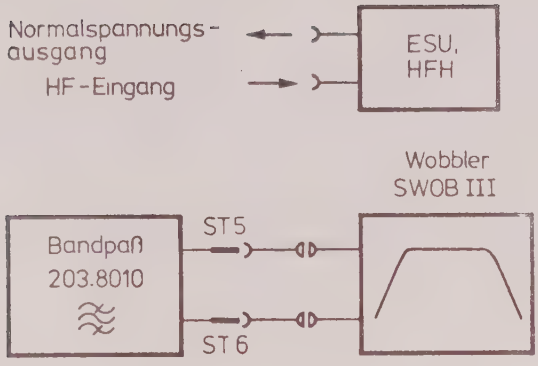
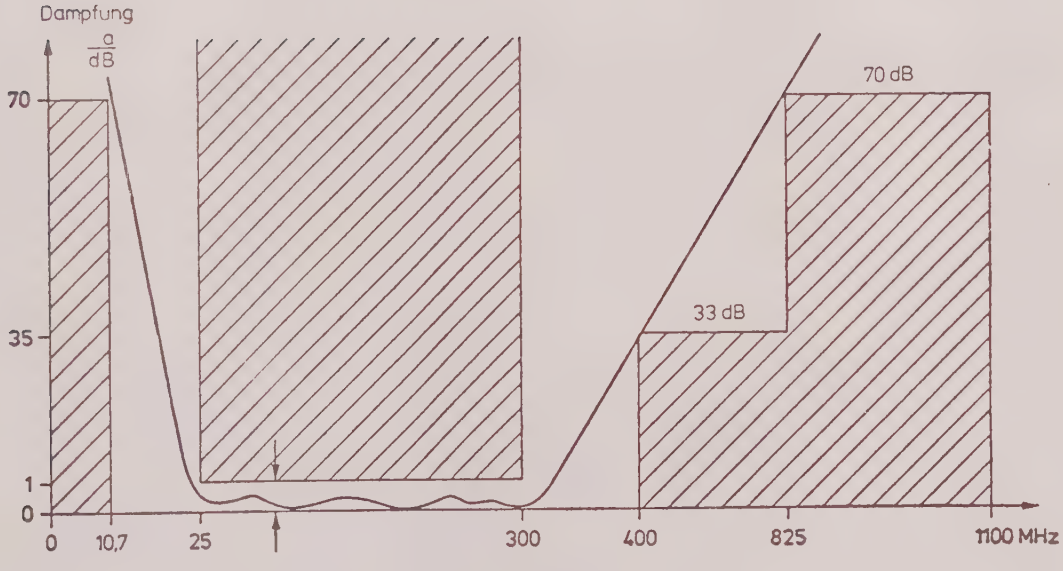


Bild 5-17 Meßaufbau zum Bandfilterabgleich



Welligkeit im Durchlaßbereich . . . . . ≤ ±0,5 dB
bzw. max. Einfügungsdämpfung . . . . . 1 dB

Bild 5-18 Durchlaßkurve des Bandfilters

Bild 5-19: Prüfung des Teilerfehlers

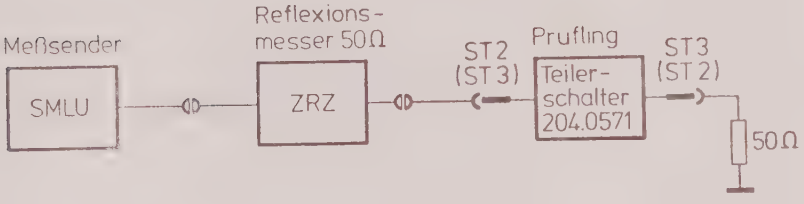


Bild 5-20: Messung des Reflexionsfaktor

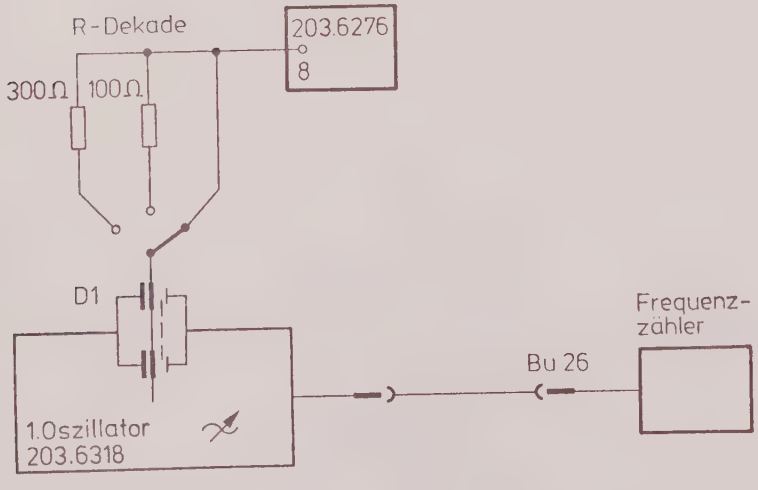


Bild 5-21: Frequenzänderung durch Variation der Basis-spannung von T5 (1.Oszillator)

5-19
5-20
5-21

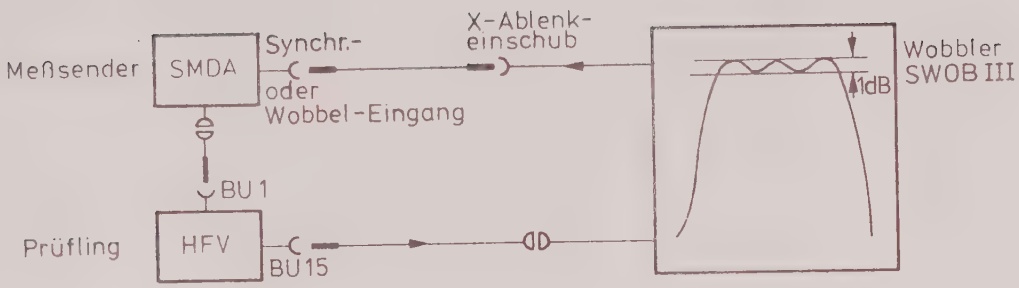


Bild 5-22: Kontrolle der ZF-Durchlaßkurve

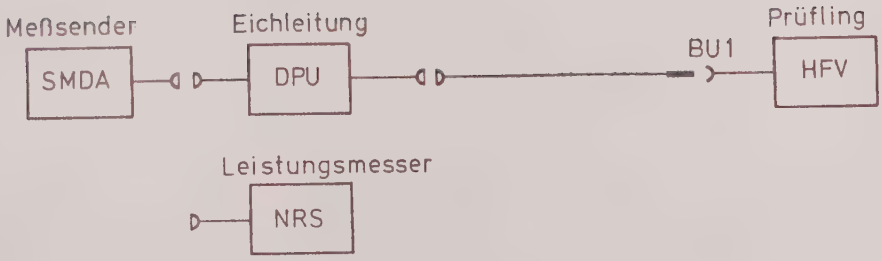


Bild 5-23: Kontrolle des Skalenverlaufs

Bild 5-24.1:

Tastkopf-Abgleich mit
Rechteckkalibrator.
Oszillograf Tektronix 545 A.
Tastkopf 10:1.

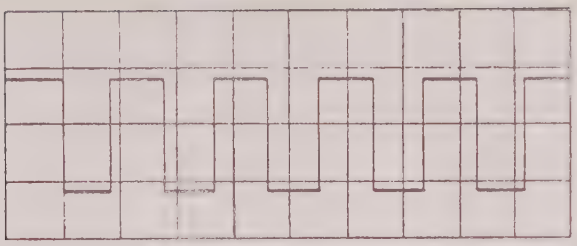


Bild 5-24.2:

Rechteckimpuls am MP.
Koppelkondensator C7 entfernt.
Teiler 10:1.
X : 2 ms/cm; Y : 2 V/cm.

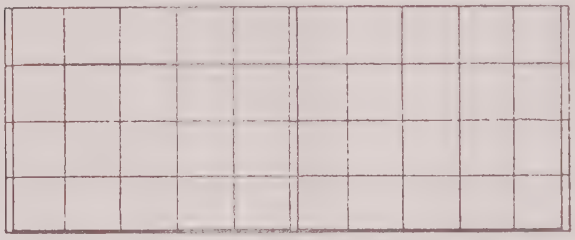


Bild 5-24.3:

Rechteckimpuls am MP.
Koppelkondensator C7 entfernt.
Teiler 10:1.
X : 20 µs/cm; Y : 2 V/cm.

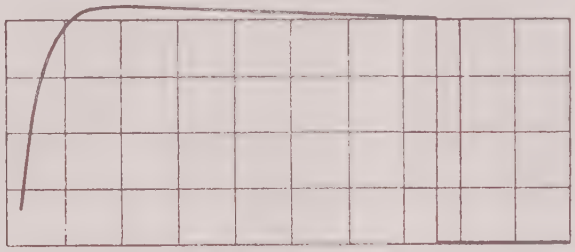


Bild 5-24.4:

Rechteckimpuls am MP.
Koppelkondensator C7 eingebaut.
Teiler 10:1.
X : 2 ms/cm; Y : 2 V/cm.

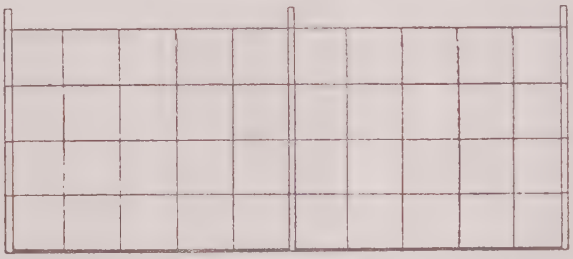


Bild 5-24.5:

Rechteckimpuls am MP.
Koppelkondensator C7 eingebaut.
Teiler 10:1.
X : 20 µs/cm; Y : 2 V/cm.

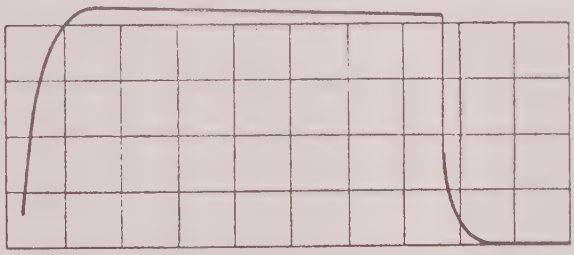
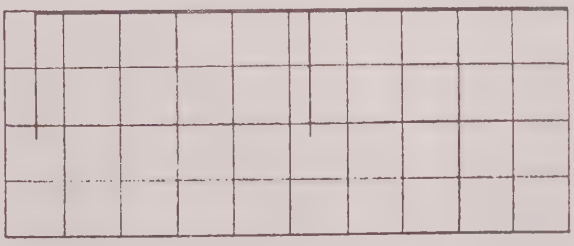


Bild 5-24.6:

Differenzierter Impuls an C7, L1, L4.
Teiler 10:1.
X ; 2 ms/cm AC; Y : 2 V/cm.



Einstellung des Pulsgenerators

Bild 5-24.7:

Differenzierter Impuls an C7, L1, L4.
Teiler 10:1.
X : 20 µs/cm AC; Y : 2 V/cm.

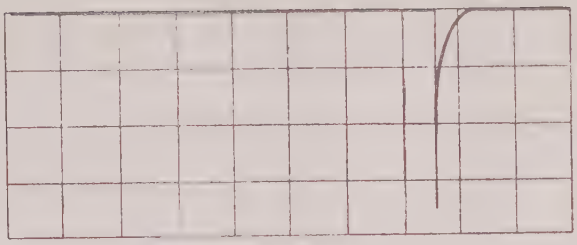


Bild 5-24.8:

Differenzierter Impuls an C7, L1, L4.
Teiler 10:1.
X : 0,2 µs/cm AC; Y : 2 V/cm.

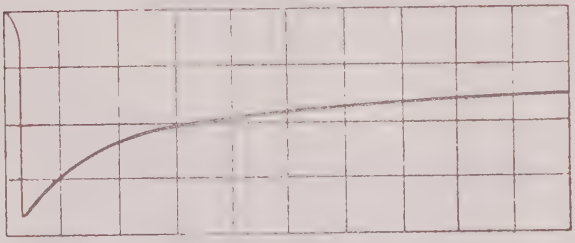


Bild 5-24.9:

Ausgangsspannung an C11.
Tastkopf 1 : 1.
X : 2 ms/cm; Y : 1 V/cm.

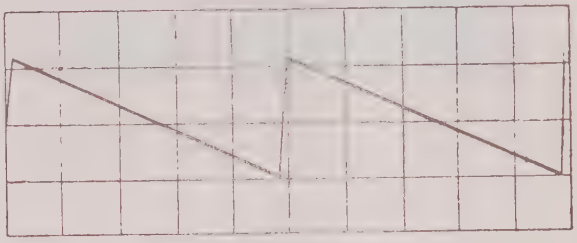


Bild 5-24.10:

Ausgangsimpuls an St4.
Mit Sampling Oszillograf
100 dots/cm; Trigger (-):
X : 1 ns/cm; Y : 100 mV/cm.

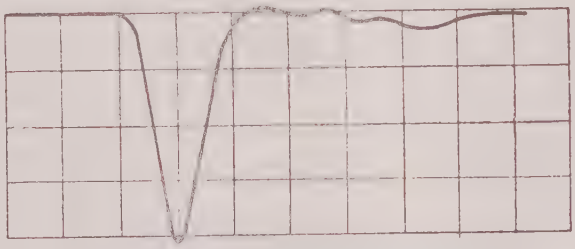


Bild 5-24.11:

Ausgangsimpuls an St4.
100 dots/cm; Trigger (-):
X : 2 ns/cm; Y : 100 mV/cm.

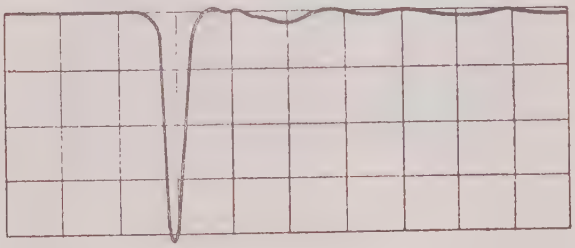
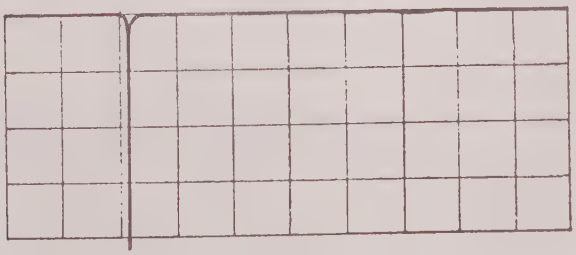


Bild 5-24.12:

Ausgangsimpuls an St4.
100 dots/cm; Trigger (-):
X : 20 ns/cm; Y : 100 mV/cm.



Einstellung des Pulsgenerators

Bild 5-24.13:

Spektrum 0...50 MHz.
Stufe bei 18 MHz stört nicht.
Weißer Streifen am Anfang des Spektrums Nulldurchgang.
Gesamthöhe des Bildes: 8 Raster.
Rauschen mit Base-Line-Clipper unterdrückt.

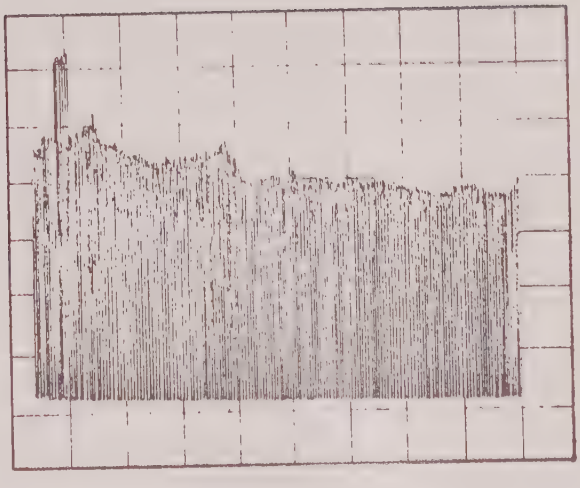
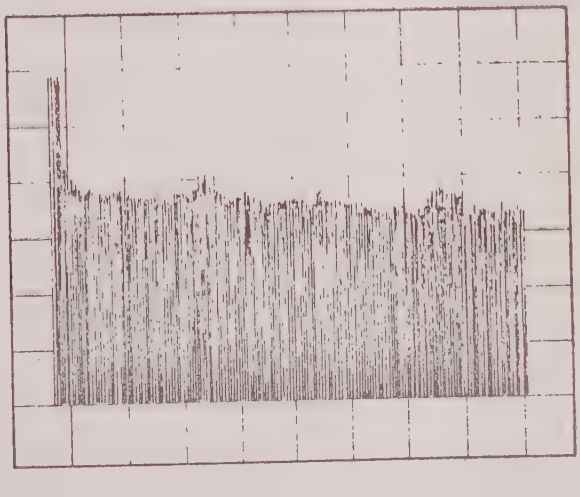
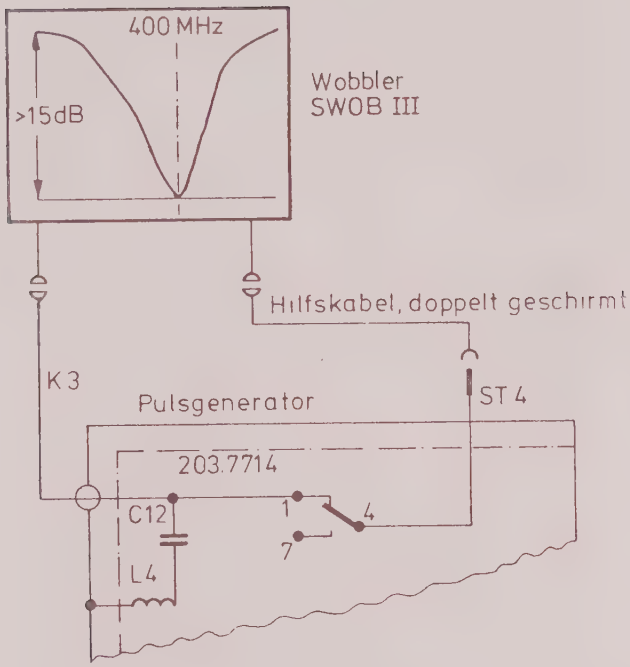


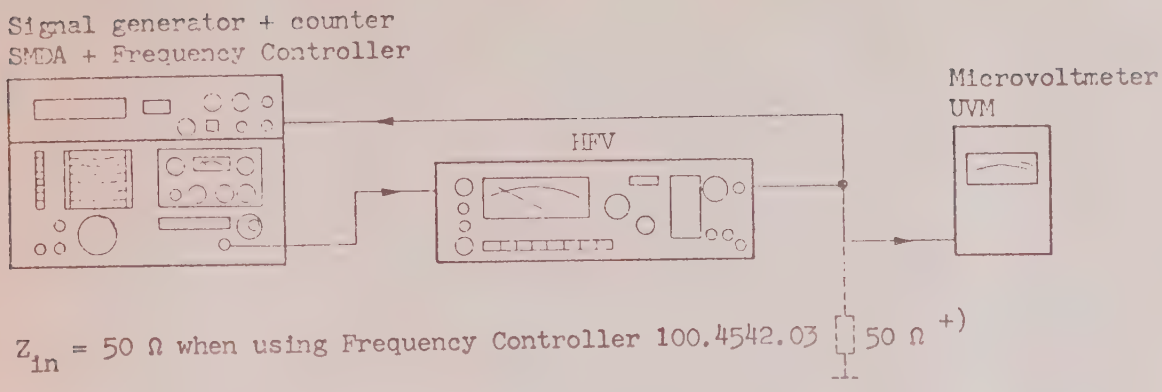
Bild 5-24.14:

Spektrum 0...500 MHz.





Abgleich der 400-MHz-Falle



+) Z_{in} = 50 Ω when using Frequency Controller 100.4542.03

Fig. 3-1: Test setup for checking the IF passband characteristic, IF output level and tuning indication

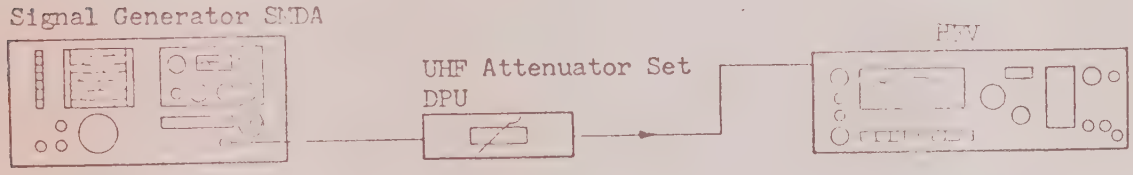


Fig. 3-2: Test setup for checking the level switch

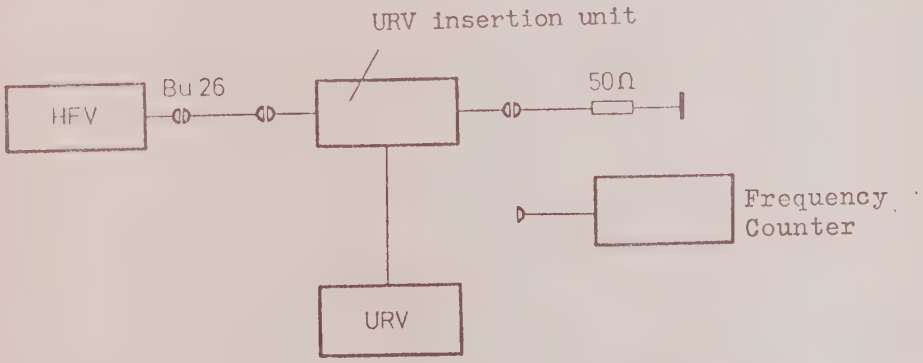


Fig. 5-21: Frequency variation by variation of base voltage of T5 (1st oscillator)

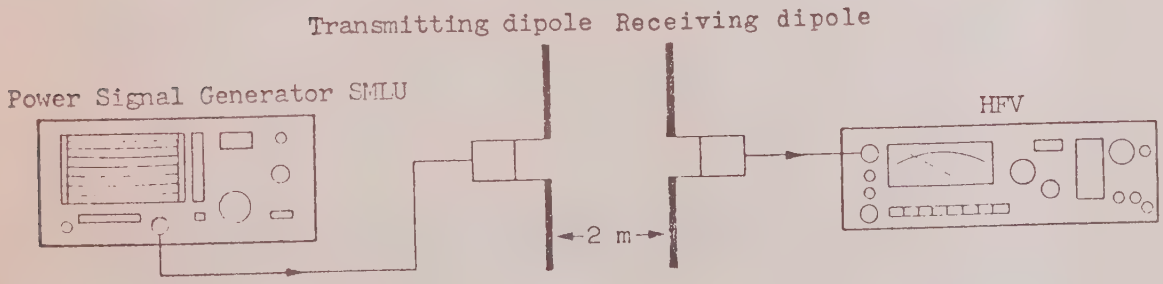


Fig. 3-4: Test setup for checking stray RF pickup and antenna factor

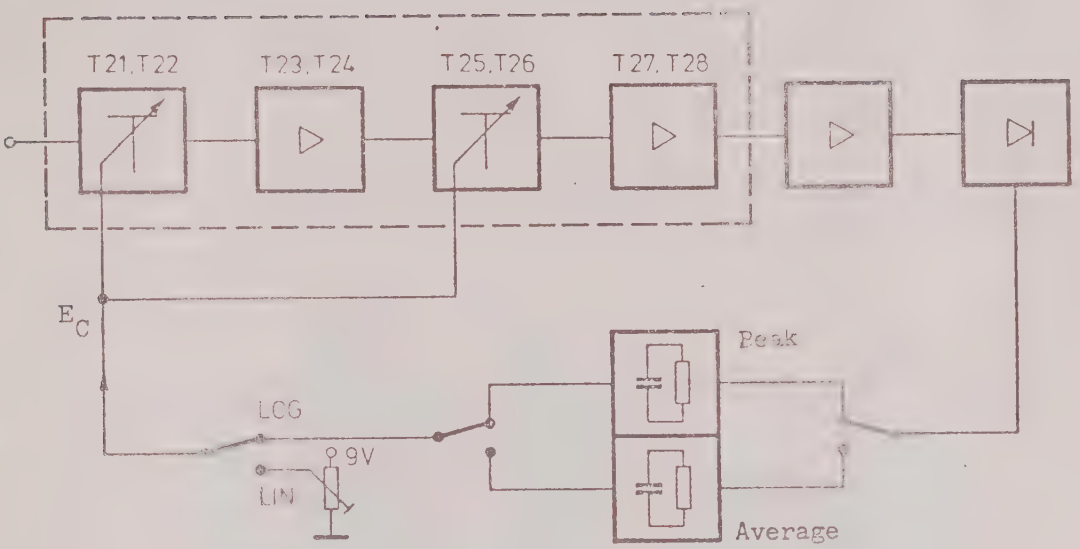


Fig. 4-1: Basic function of log. IF amplifier

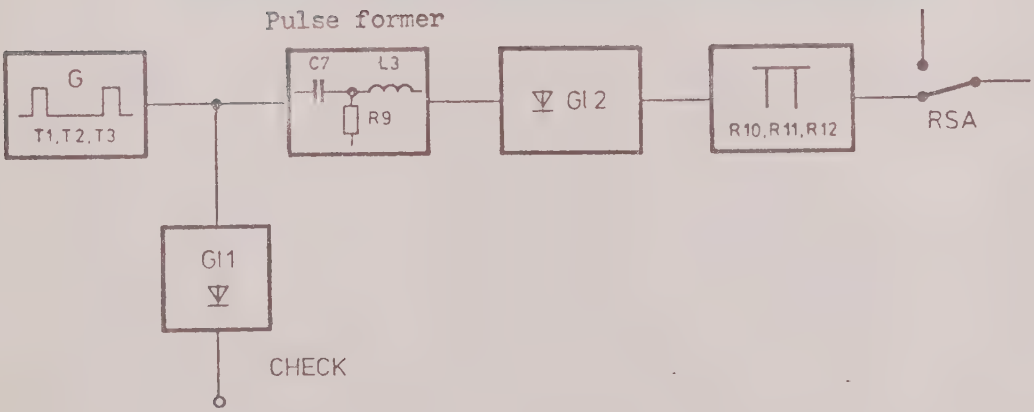


Fig. 4-2: Basic function of pulse generator

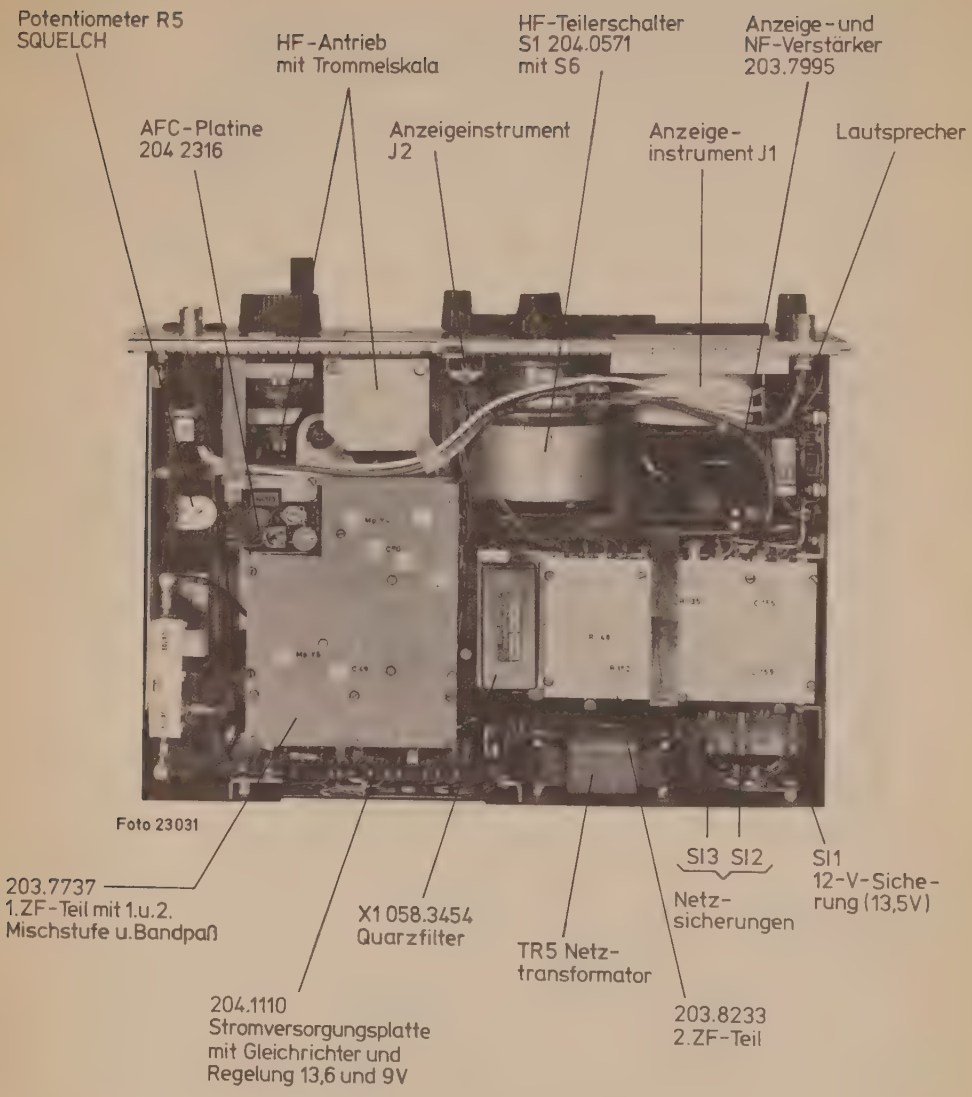


Bild 4-3: Mechanischer Aufbau (Ansicht von unten)

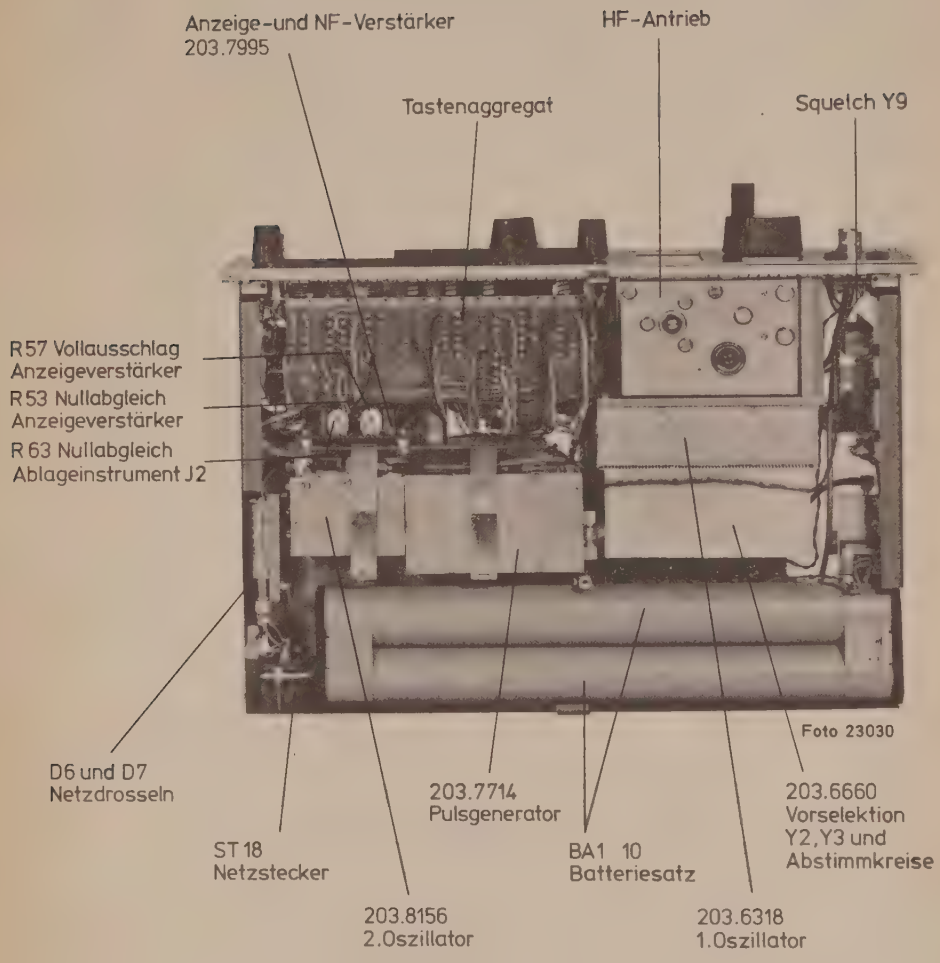
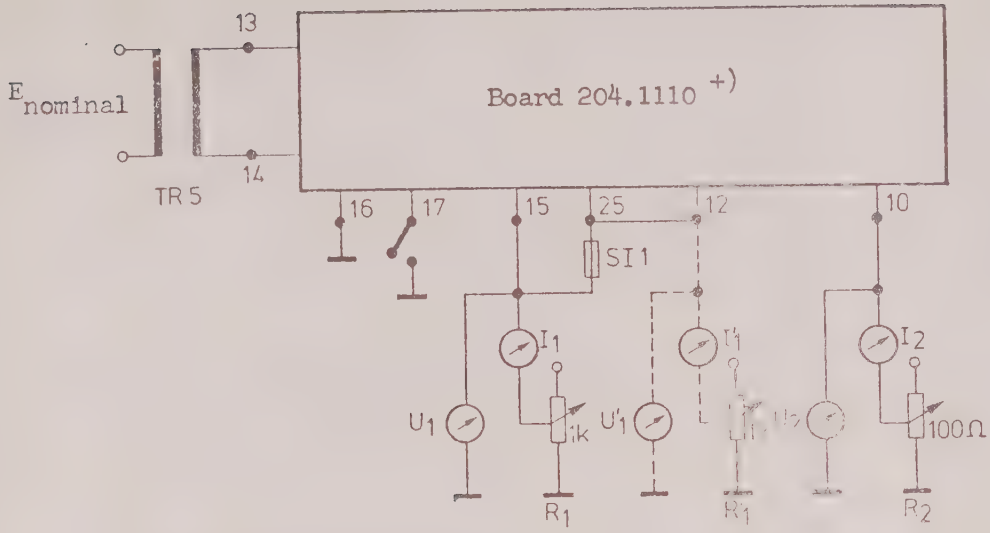


Bild 4-4: Mechanischer Aufbau (Ansicht von unten, Deckblech entfernt)



Unsolder leads at 12 and 10 and connect variable load resistors as shown.

Bild 5-1: Test setup for checking and adjusting the power supply

+) For instruments M 1958 / : 203.8210 point 25 not contained

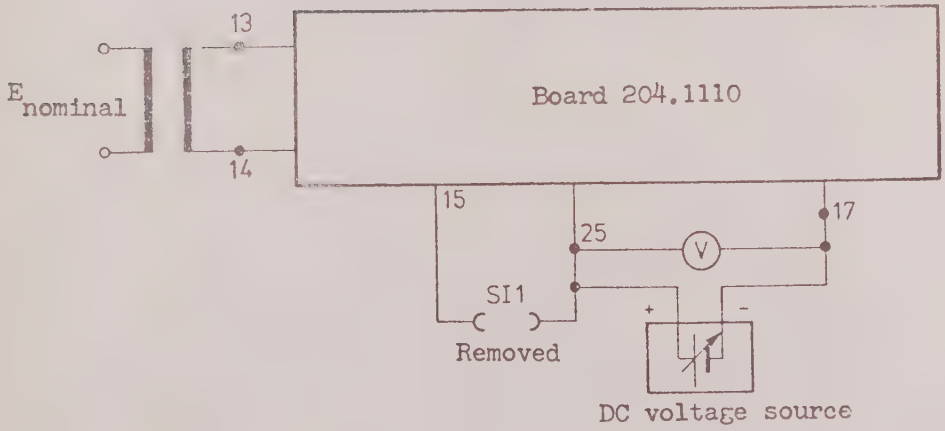


Fig. 5-2: Test setup for adjusting the switchoff threshold for protection against battery rundown

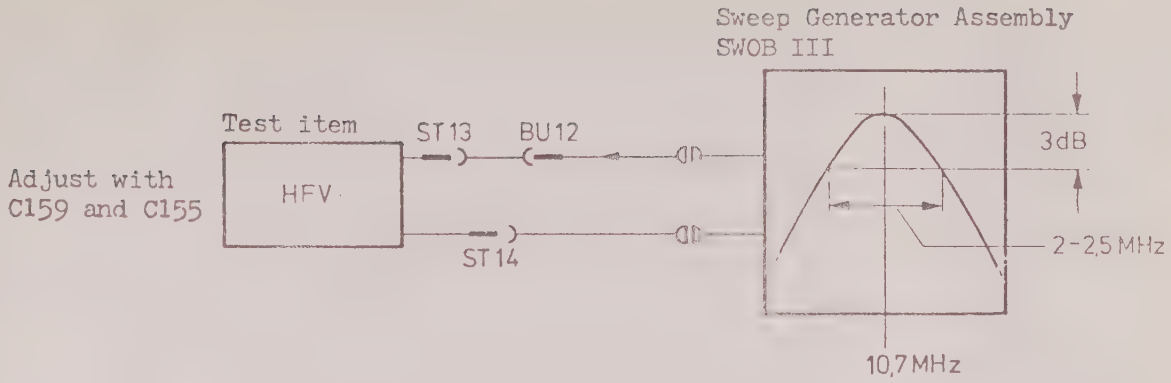


Fig. 5-3: Adjusting the final amplifier

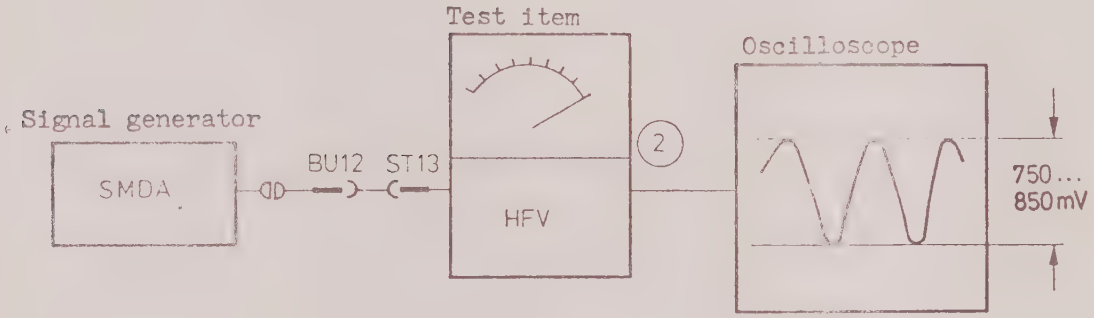


Fig. 5-4: Checking the AM demodulation

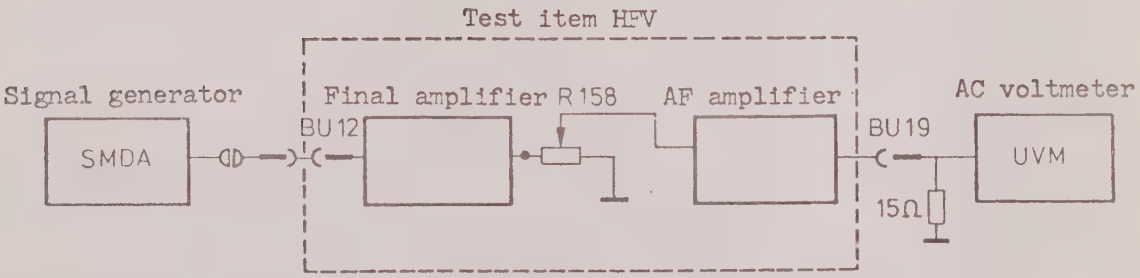


Fig. 5-5: Checking the AF amplifier

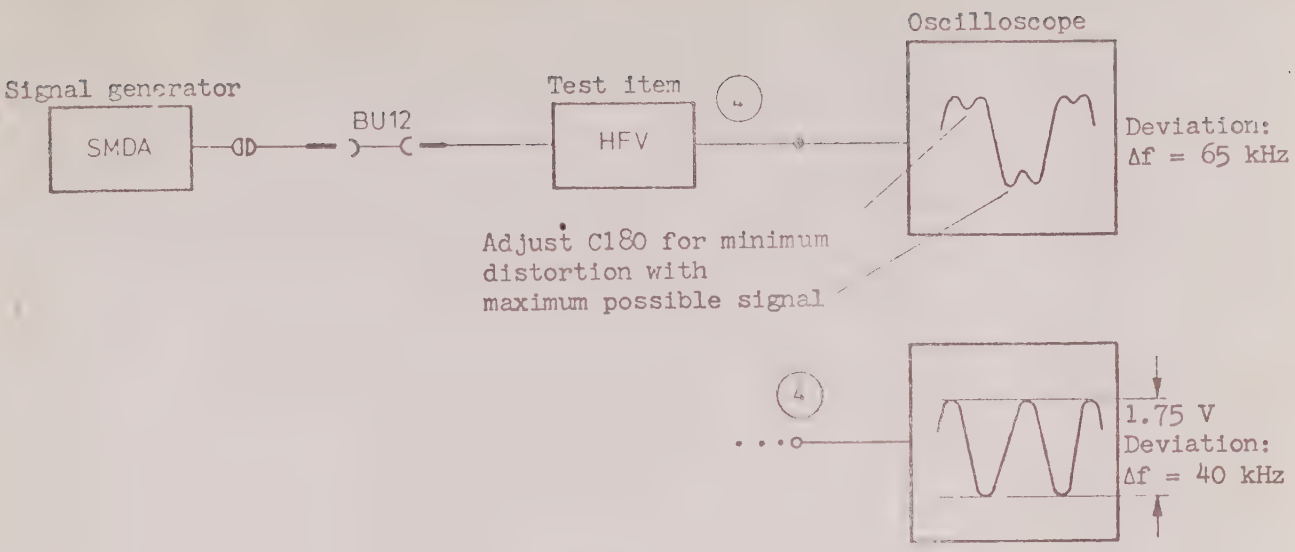


Fig. 5-6: Adjusting the FM demodulator

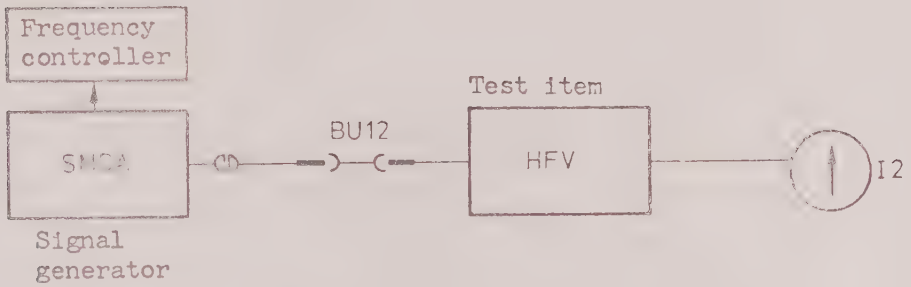


Fig. 5-7: Adjusting the tuning indicator

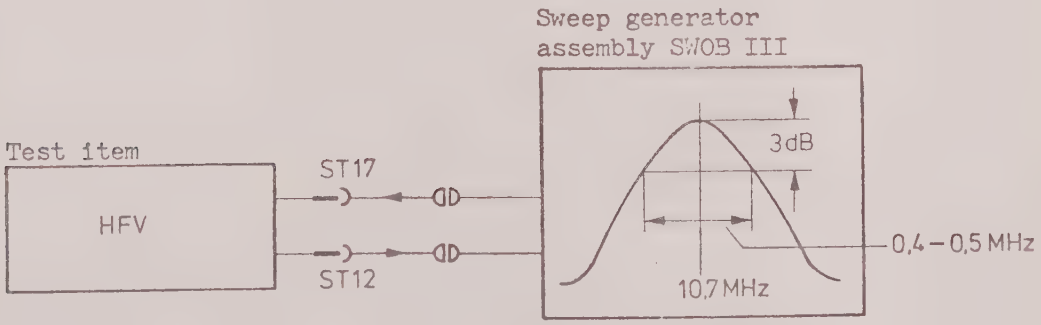


Fig. 5-8: Log. IF amplifier

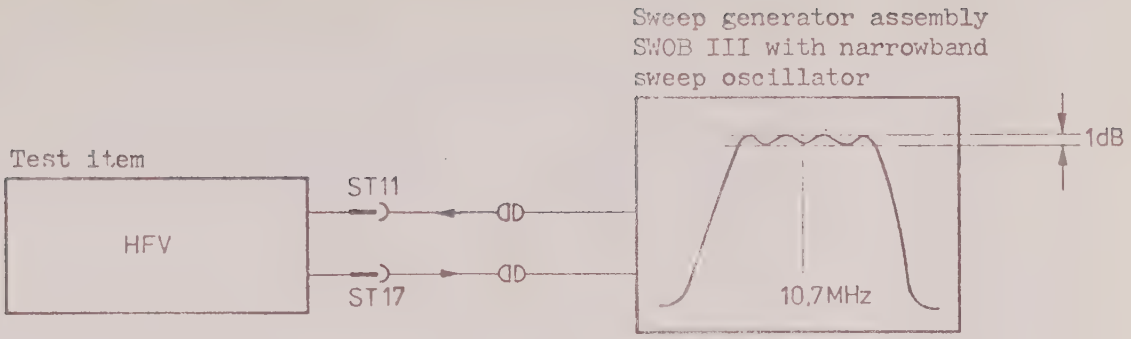


Fig. 5-9: Adjusting the preamplifier and crystal filter

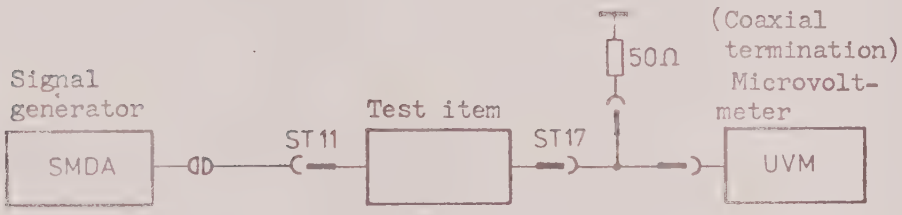


Fig. 5-10: Checking the gain between ST11 and ST17

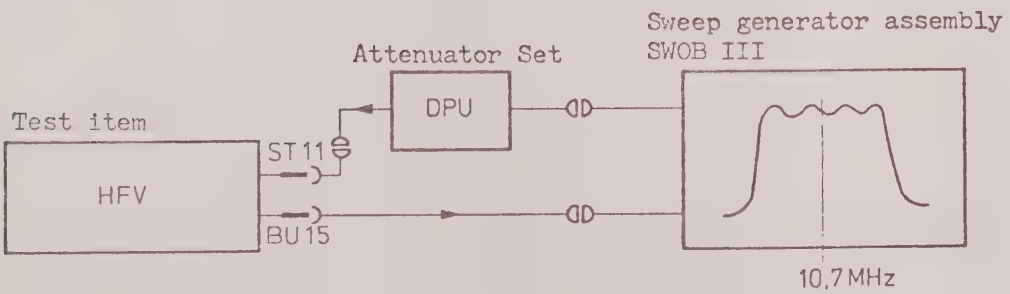


Fig. 5-11: Passband characteristic for 2nd IF

5-9
5-10
5-11

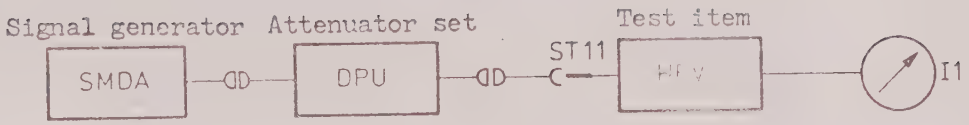


Fig. 5-12: Adjusting the control voltage of the log. IF amplifier

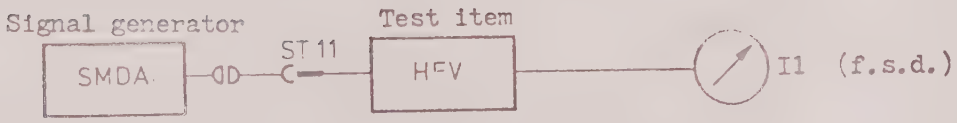


Fig. 5-13: Checking the gain margin

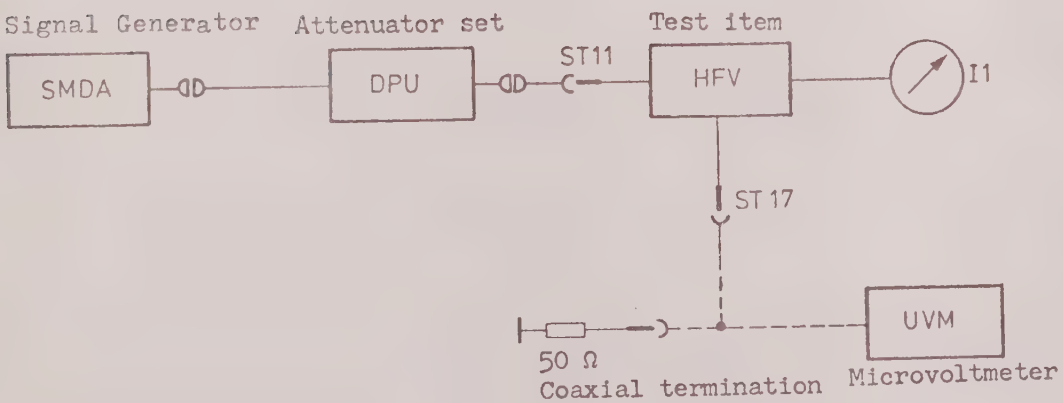


Fig. 5-14: Measuring the linearity margin

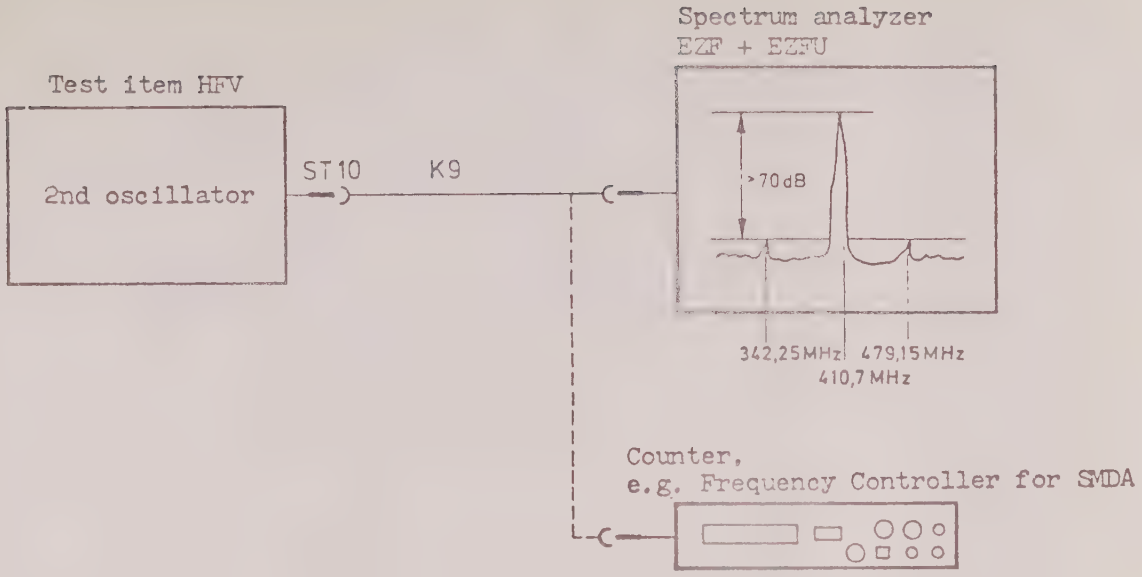
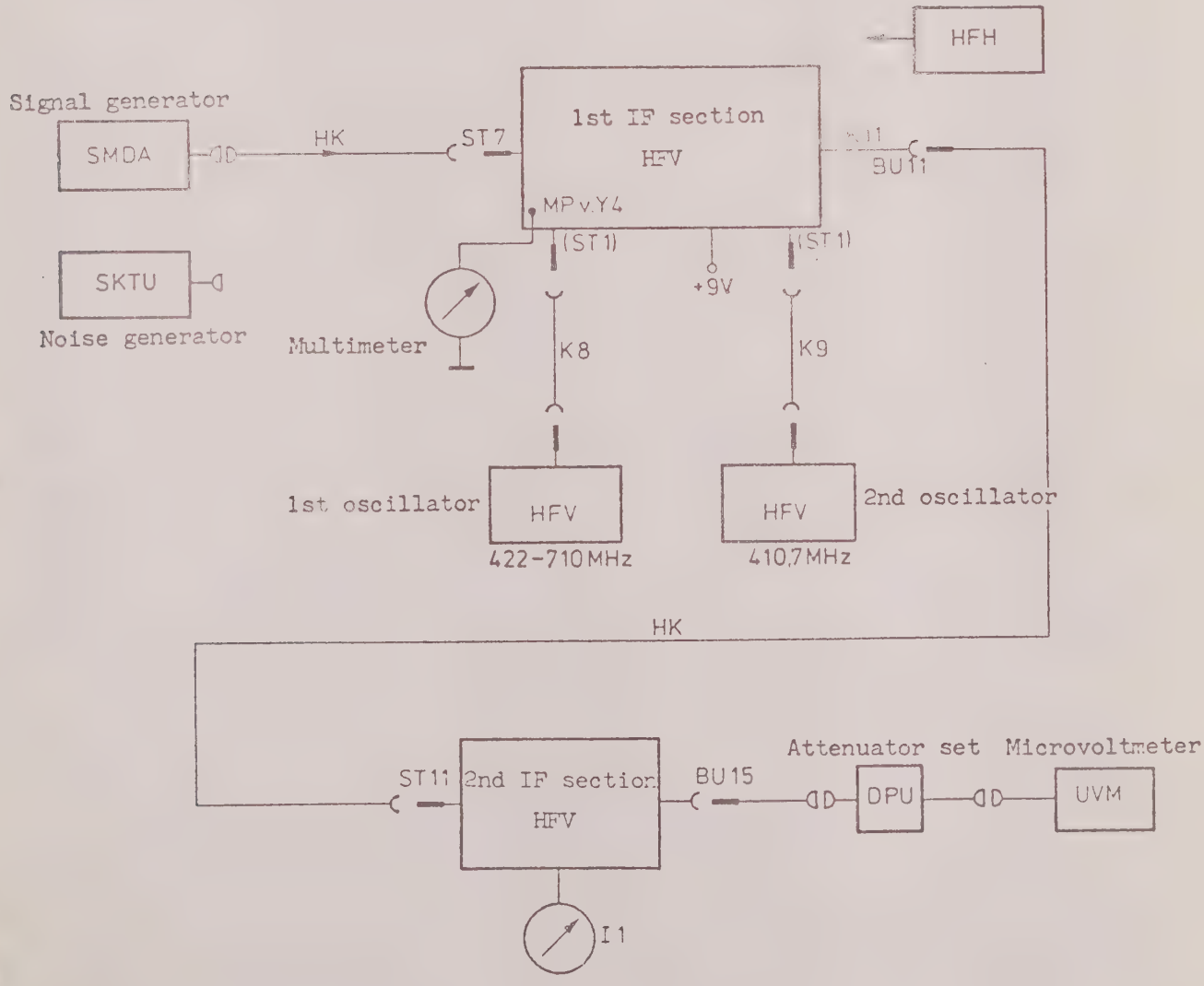


Fig. 5-15: Adjusting the 2nd oscillator



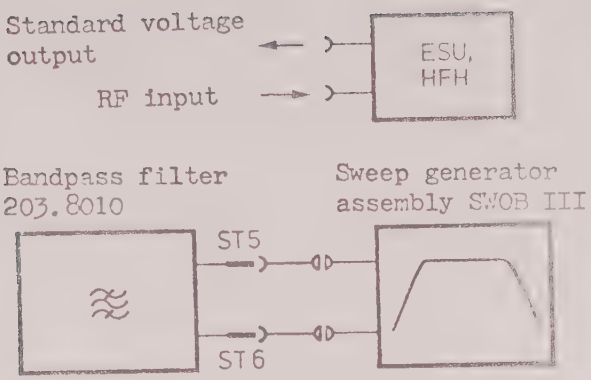


Fig. 5-17 Test setup for bandpass filter adjustment

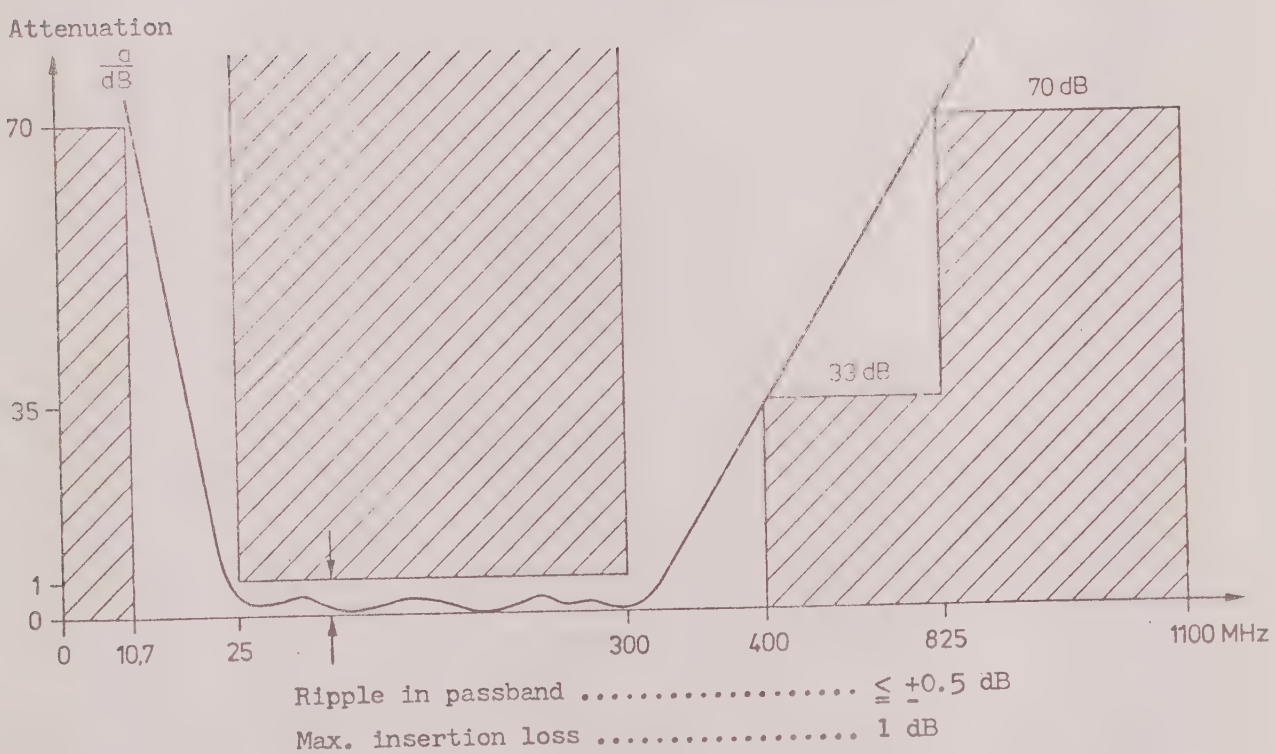


Fig. 5-18 Passband characteristic of bandpass filter

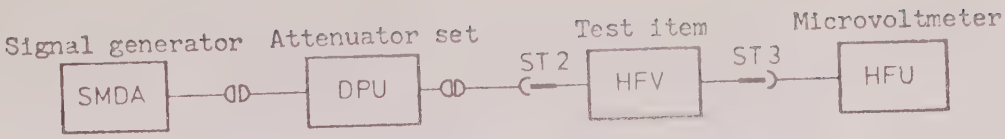


Fig. 5-19: Checking the attenuator error

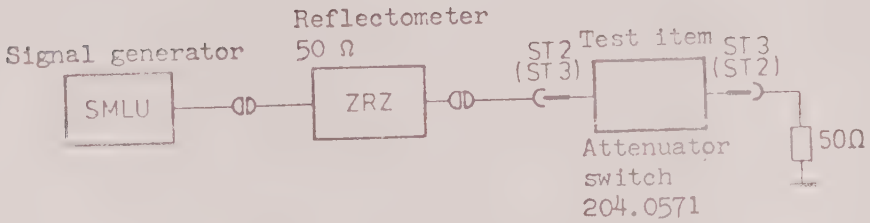


Fig. 5-20: Measuring the reflection coefficient

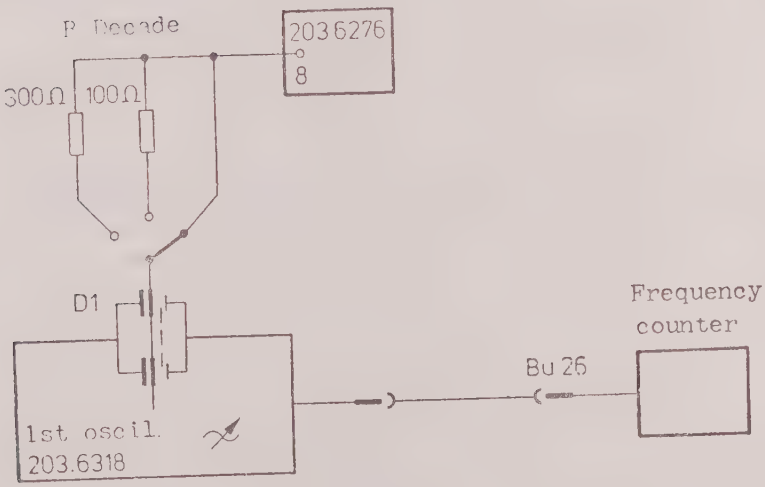


Fig. 5-21: Frequency variation by variation of base voltage of T5 (1st oscillator)

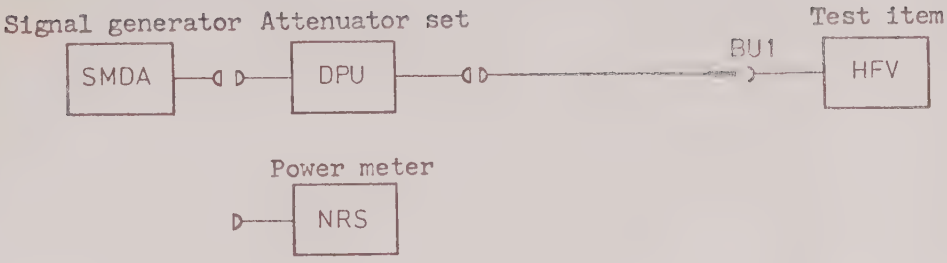


Fig. 5-23: Checking the scale

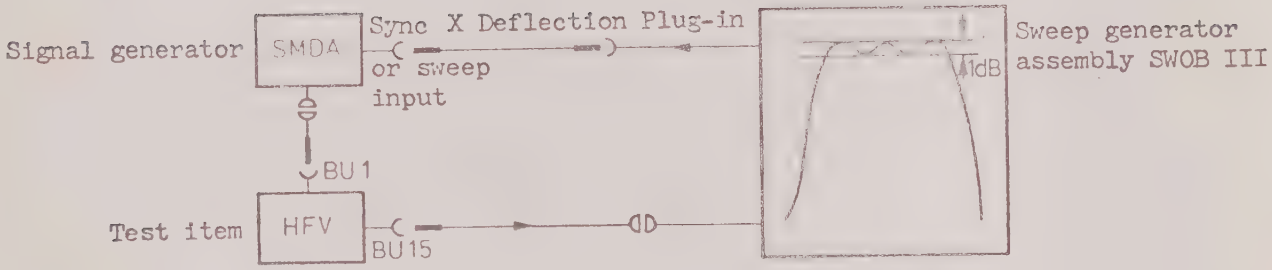


Fig. 5-22: Checking the IF passband characteristic

Fig. 5-24.1:

Probe adjustment with
squarewave calibrator.
Oscilloscope Tektronix 545 A.
Probe 10:1

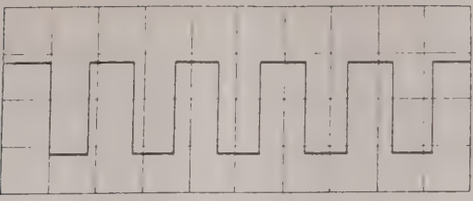


Fig. 5-24.2:

Squarewave pulse at MP
Coupling capacitor C7 removed.
Attenuator 10:1.
X : 2 ms/cm: Y : 2 V/cm.

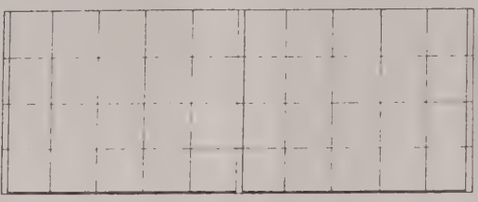


Fig. 5-24.3:

Squarewave pulse at MP
Coupling capacitor C7 removed.
Attenuator 10:1.
X : 20 µs/cm; Y : 2 V/cm.

Fig. 5-24.4:

Squarewave pulse at MP.
Coupling capacitor C7 incorporated.
Attenuator 10:1.
X : 2 ms/cm; Y : 2 V/cm.

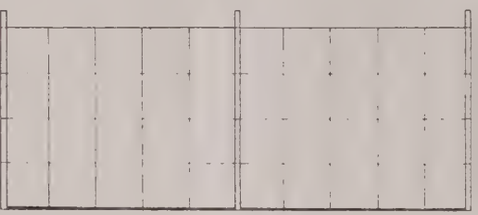


Fig. 5-24.5:

Squarewave pulse at MP
Coupling capacitor C7 incorporated.
Attenuator 10:1.
X : 20 µs/cm; Y : 2 V/cm.

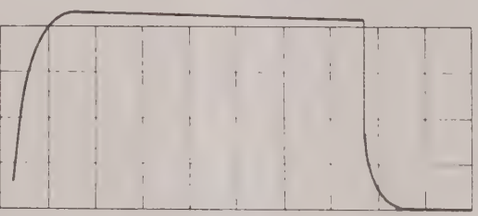


Fig. 5-24.6:

Differentiated pulse at C7, L1, L4.
Attenuator 10:1.
X : 2 ms/cm AC; Y : 2 V/cm.

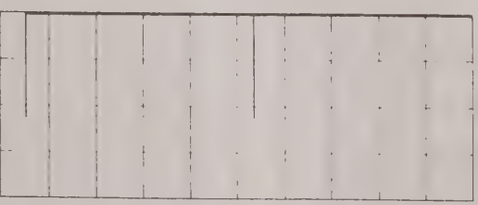


Fig. 5-24 (1): Adjusting the pulse generator

Fig. 5-24.7:

Differentiated pulse at C7, L1, L4.
Attenuator 10:1.
X : 20 µs/cm AC; Y : 2 V/cm.

Fig. 5-24.8:

Differentiated pulse at C7, L1, L4.
Attenuator 10:1.
X : 0.2 µs/cm AC; Y : 2 V/cm.

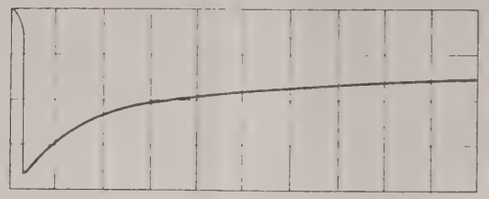


Fig. 5-24.9:

Output voltage at C11.
Probe 1:1.
X : 2 ms/cm; Y : 1 V/cm

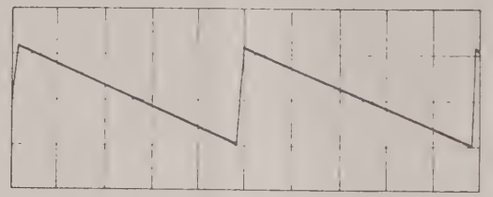


Fig. 5-24.10:

Output pulse at St4.
Using sampling oscilloscope
100 dots/cm; trigger (-);
X : 1 ns/cm; Y : 100 mV/cm.

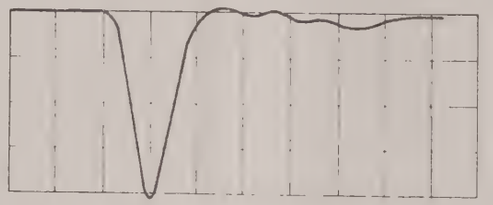


Fig. 5-24.11:

Output pulse at St4.
100 dots/cm; trigger (-);
X : 2 ns/cm; Y : 100 mV/cm.

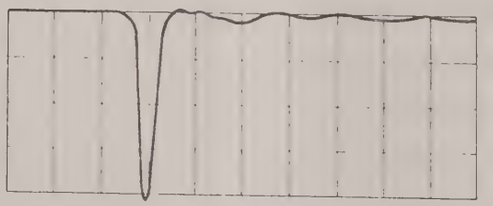


Fig. 5-24.12:

Output pulse at St4.
100 dots/cm; trigger (-);
X : 20 ns/cm; Y : 100 mV/cm.

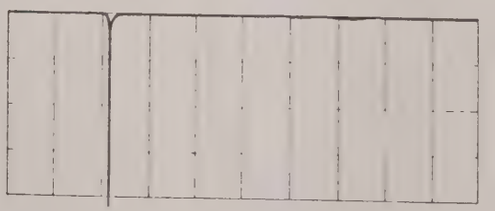


Fig. 5-24 (2): Adjusting the pulse generator

Fig. 5-24.13:

Spectrum 0 - 50 MHz.
Step at 18 MHz has no
adverse effect.
White band at beginning
is zero passage.
Overall pattern height: 8 div.
Noise suppressed by baseline
clipper.

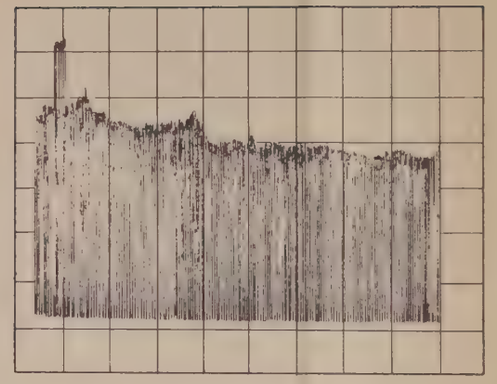


Fig. 5-24.14:

Spectrum 0 - 500 MHz.

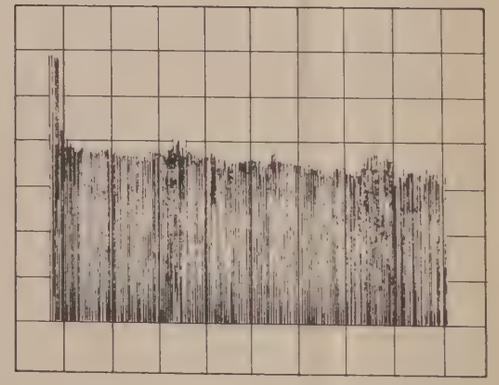


Fig. 5-24: Adjusting the pulse generator

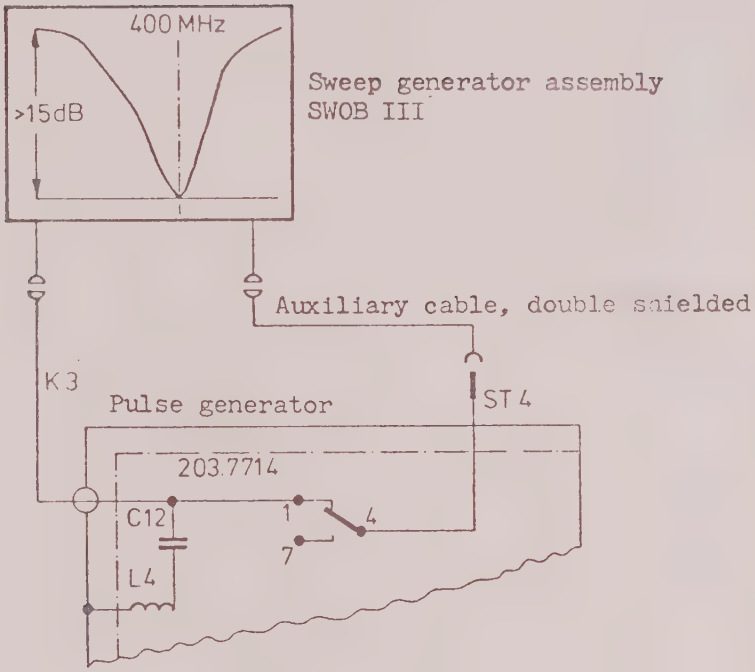


Fig. 5-25: Adjusting the 400-MHz trap

ROHDE&SCHWARZ
MÜNCHEN

Schaltteillisten numerisch geordnet
Parts lists in numerical order

R 29500 Bl. 3

R&S-SCHLÜSSELLISTE

Die R&S-Schaltteillisten nennen in der Spalte „Benennung / Beschreibung" die technischen Daten der Bauelemente in Kurzform. Die Art des Bauelements (z. B. Schicht-, Draht-Widerstand usw.) beschreiben die 2 Kennbuchstaben vor der „Benennung" (evtl. auch vor der Sachnummer"), die nachfolgend erklärt werden. In Ersatzteil-Bestellungen an R&S ist stets die Angabe der vollständigen Sachnummer erforderlich.

R&S KEY LIST

The R&S Parts Lists give the technical data of the components in short form in the column "Benennung / Beschreibung" (designation). The type of component (e. g. depos.-carbon resistor, wire-wound resistor etc.) is indicated by 2 identification letters before the designation, possibly also before the "Sachnummer" (order number), wich are explained below. When ordering spare parts from R&S, the complete order number must always be specified.

Kenn-buchst.	Art des Bauelements	Identif.-letter	Type of component
AD	Diode, Gleichrichter	AD	Diode, rectifier
AE	Spezialdiode, z. B. Tunnel-, Kapazitäts-, Zener-Diode	AE	Diode (special), e. g. tunnel diode, varactor, Zener diode
AF	Fotoelement, z. B. Foto-Diode, -widerstand, Leuchtdiode	AF	Light-sensitive component, e. g. resistor, diode; LED
AG	Gleichrichter, z. B. Thyristor, Triac, Selengleichrichter	AG	Rectifier, e. g. thyristor, triac, selenium rectifier
AK	Kleinsignal-Transistor	AK	Low-power transistor
AL	Leistungs-Transistor	AL	High-power transistor
AM	Spezial-Transistor, z. B. FET, MOSFET	AM	Transistor (special), e. g. FET, MOS-FET
AP	Peltier-, Hall-Element	AP	Peltier element, Hall element
AR	Röhre für Empfänger, Verstärker, Gleichrichter	AR	Valve for receiver, amplifier, rectifier
AS	Spezialröhre, z. B. Senderöhre, EW-Widerstand, Stabilisator	AS	Valve (special), e. g. for transmitter; barretter, ballast valve
AT	Katodenstrahlröhre, z. B. Bildröhre, Ziffern-Anzeigeröhre	AT	Cathode-ray tube, e. g. picture tube, digital indicator tube
AW	Spannungs- oder temperaturabhängiger Widerstand	AW	Voltage- or temperature-dependent resistor
BC	Integr. Schaltkreis (Microcomp.)	BC	Integrated circuit (microcomputer)
BD	R&S - Dünnschichtschaltung	BD	R&S - thinfilm circuit
BG	Gerätebaugruppe	BG	Subassembly
BJ	Integr. Schaltkreis (Interface)	BJ	Integrated circuit (interface)
BK	Kernspeicher	BK	Core memory, magnetic memory
BL	Log. Schaltkreis z. B. Flop, Gatter, Counter	BL	Logic circuit, e. g. DTL, TTL, ECL, C-MOS
BM	Baustein, z. B. Mischer, Tuner	BM	Hybrid module, e. g. mixer, tuner
BO	Operationsverstärker	BO	Operational amplifier
BP	Anzeigeeinheit, Optokoppler	BP	Display section, opto coupler
BS	Ansteuerbaustein	BS	Decoder / driver
BV	Stromversorgung, Übersp.-Schutz	BV	Power pack, protective circuit
CB	Bypass-, Durchf.-Kondensator	CB	Bypass capacitor, feed-through capacitor
CC	Keramischer Kondensator	CC	Ceramic capacitor
CD	Drehkondensator	CD	Variable capacitor
CE	Elektrolyt-Kondensator	CE	Electrolytic capacitor
CG	Glimmer-Kondensator	CG	Mica capacitor
CH	Sperrschichtkondensator	CH	Semiconductor capacitor
CK	Kunstfolien-Kondensator	CK	Synthetic-foil capacitor
CL	Ker. Hochsp.-Kondensator	CL	HV capacitor (ceramic)
CM	Metallpapier-Kondensator	CM	MP capacitor
CN	Kondensatornetzwerk	CN	Capacitor network
CP	Papier-Kondensator	CP	Paper capacitor
CS	Störschutz-Kondensator	CS	Interference-suppression capacitor
CT	Trimmkondensator	CT	Trimmer capacitor
CV	Vakuum-Kondensator	CV	Vacuum capacitor

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Kenn-buchst.	Art des Bauelements	Identif.-letter	Type of component
DD	Schalt- und Wickeldrähte	DD	Hook-up or winding wire
DF	Flachleitung, Litze	DF	Flat multiple line, stranded wire
DG	Abgeschirmte Leitung	DG	Shielded line
DH	Koaxialkabel	DH	Coaxial line
DL	HF-Litze	DL	Litz wire
DM	Schaltlitze	DM	Stranded wire
DN	Antennenstab	DN	Antenna rod
DS	Isol. Leitung mit Stecker	DS	Insulated cable with plug
EB	Blei-/NC-Akku, Batterie	EB	Lead or alkaline accumulator, battery
EF	Glühlampe, Leuchte	EF	Incandescent lamp, pilot lamp
EG	Glimmlampe	EG	Glow lamp
EK	Kontakt-Streifen,-Feder	FK	Contact clip, contact spring
EL	Lautspr., Kopfhörer, Mikrofon	EL	Loudspeaker, headphones, microphone
EM	Motor, Hubmagnet, Drehfeldsystem	EM	Motor, lifting magnet, synchro system
EO	Oszillator, z. B. Quarzoszillator	EO	Oscillator, e. g. crystal oscillator
EP	Tief-, Band-, Hochpaß, Bandsperre, Diskriminator	EP	Lowpass, bandpass, highpass filter, band-stop filter, discriminator
EQ	Schwing-/Filter-Quarz	EQ	Oscillator or filter crystal
ER	Resonator	ER	Resonator
ES	Passive SHF-Bauteile	ES	Passive SHF components
ET	Thermostat	ET	Thermostat
EV	Lüfter	EV	Ventilator
FA	Dezifix/Prexifix A	FA	R&S coaxial connector
FB	Dezifix B	FB	R&S coaxial connector
FC	Dezifix C	FC	R&S coaxial connector
FD	Dezifix D	FD	R&S coaxial connector
FE	Dezifix E/F/J	FE	R&S coaxial connector
FG	Koax-Umrüstsatz	FG	Coaxial screw-in assembly
FH	Koax-Übergang auf Fremdsystem	FH	Coaxial adaptor
FJ	BNC-Systemteil	FJ	BNC screw-in assembly
FK	Koax-UHF-Systemteil	FK	Coaxial UHF screw-in assembly
FM	Mehrfachstecker, Buchsenleiste	FM	Multipoint connector
FN	Netz-Steckverbindung	FN	AC-supply connector
FO	Runde Mehrfach-Steckverbindung	FO	Round multipoint connector
FP	Druckschalt.-Steckverbindung	FP	Multipoint connector for PC boards
FR	Fassung für Lampen, Sicherung, usw.	FR	Socket for lamp, fuse, etc.
FT	Schwachstrom-Steckverbindung	FT	LV plug and socket
FU	Hochsp.-Steckverbindung	FU	HV plug and socket
FV	Verbinder (z. B. AMP)	FV	Push-on connector
JB	Zeiger-Thermometer	JB	Pointer-type thermometer
JD	Drehspul-Anzeigeinstrument	JD	Moving-coil meter
JE	Dreheisen-Anzeigeinstrument	JE	Moving-iron meter
JF	Frequenz-Anzeigeinstrument	JF	Frequency meter
JG	Spannungs-Anzeigeinstrument	JG	Moving-coil meter with rectifier
JH	Betriebsstundenzähler	JH	Operating-hours counter
JJ	Impulszähler	JJ	Pulse counter
JK	Abstimmanzeiger	JK	Tuning indicator

Kenn-buchst.	Art des Bauelements	Identif.-letter	Type of component
JM	Mechanisches Zählwerk	JM	Mechanical counter
JP	Projektions-Instrumente (Leuchtziffer)	JP	Panel meters
JQ	Leuchtziffern-Anzeigeinstrument	JQ	Digital display
JS	Registrierendes Anzeigeinstrument, Spiegelgalvanometer	JS	Recording meter, reflecting galvanometer
JU	Uhrwerk	JU	Clockwork
JW	Elektrodyn. Anzeigeinstrument	JW	Electrodynamic meter
LC	Keramische Spule	LC	Ceramic coil
LD	Netz-, HF-Drossel, Df-Filter	LD	Choke, lead-through filter
LE	Einzelkreise, Bandfilter	LE	Single tuned circuit, bandpass filter
LP	Permanentmagnet	LP	Permanent magnet
LT	Netztransformator	LT	Power transformer
LU	NF-Übertrager	LU	AF transformer
LV	Variometer	LV	Variometer
RD	Drahtwiderstand	RD	Wire-wound resistor
RF	Kohleschicht-Widerstand	RF	Carbon-film resistor
RG	Metallglasur-Widerstand	RG	Metal-coated resistor
RJ	Metalloxyd-Widerstand	RJ	Metal-oxide resistor
RL	Metallfilm-Widerstand	RL	Metal-film resistor
RM	Widerstandsdraht	RM	Resistance wire
RN	Widerstandsnetzwerk	RN	Resistor network
RR	Draht-Potentiometer	RR	Wire-wound potentiometer
RS	Schicht-Potentiometer	RS	Carbon-film potentiometer
RT	Dämpfungsglied	RT	Attenuator
RV	Drahtwiderstand mit Abgriff	RV	Wire-wound resistor, tapped
RW	Wendelpotentiometer	RW	Helical potentiometer
SB	Drucktastenschalter	SB	Pushbutton switch
SD	Drehschalter	SD	Rotary switch
SF	Kontaktfeder, Schaltbuchse	SF	Spring contact
SH	HF-Koaxialschalter	SH	Coaxial RF switch
SK	Kipp-, Wipp- und Schiebeschalter	SK	Toggle switch, slide switch
SL	Leistungsschalter Netz/HF	SL	AC supply switch, high-power RF switch
SM	Mikroschalter	SM	Microswitch
SN	Elektromagnet, Relais	SN	Electromagnetic relay
SP	Leistungsrelais, Luftschütz	SP	Power relay, air-type contactor
SR	Reedrelais	SR	Reed relay
SS	Sicherung, Schutzschalter	SS	Fuse, automatic cut-out
ST	Thermoschalter	ST	Thermal circuit breaker
SU	Überspannungs-Ableiter	SU	Arrester
SW	Wechselrichter	SW	Inverter (DC-AC)
SZ	Zeitschalter	SZ	Time switch
VK	Klemme, Klemmleiste	VK	Clamp, terminal strip

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Anmerkung/Note:

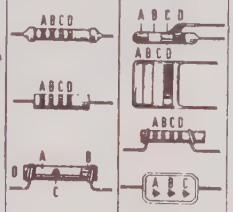
Die Wertangabe der weitgehend miniaturisierten Bauelemente erfolgt überwiegend durch Farbkennzeichnungen, deren Bedeutung der nachfolgenden Tabelle entnommen werden kann.

The electrical values of the largely miniaturized components are mainly identified by a colour code, the meaning of which can be taken from the table below.

Farbcode für Widerstände und Kondensatoren / Colour code for resistors and capacitors

Farbe	A	B	C	D
Schwarz/Black	–	0		
Braun/Brown	1	1	0	± 1%
Rot/Red	2	2	00	± 2%
Orange	3	3	000	
Gelb/Yellow	4	4	0000	
Grün/Green	5	5	00000	± 0,5%
Blau/Blue	6	6	000000	
Violett	7	7	–	
Grau/Gray	8	8	–	
Weiß/White	9	9	–	
Gold	–	–	–	± 5%
Silber/Silver	–	–	–	±10%
Ohne Farbe/ No colour	–	–	–	±20%

Anordnungsbeispiele für Widerstände (R) Kondensat (C)



Definitionen*

Kennzeichen A (Bauteilfarbe/1. Farbring) = 1. Zahl /
Marking A (body colour or first coloured ring) = 1st digit;

Kennzeichen B (Bauteilende/2. Farbring) = 2. Zahl /
Marking B (body end or second coloured ring) = 2nd digit;

Kennzeichen C (Punkt/ 3. Farbring) = 3. Zahl = Zahl der Nullen /
Marking C (dot or third coloured ring) = number of zeroes;

Kennzeichen D (Punkt/ 4. Farbring) = Toleranz des Nennwerts in %.
(Fehlendes Kennzeichen für D bedeutet + 20%.)
Marking D (dot or fourth coloured ring) = tolerance on nominal value in %.
(with no D marking: tolerance = ± 20%)

Das Fehlen eines Kennzeichens bedeutet, daß die Farbe des Bauteilkörpers die Wertangabe darstellt. / The absense of a marking signifies that the body colour gives the corresponding information.

* siehe auch DIN 41 429 und DIN 40 825 / see also IEC publication 62-1952 and 62-1968.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	01

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	VHF-FELDSTAERKEMESSER HFVZ STROMLAUF 203.6018 S	203.6018	203.6018
B1	BO CA3020ABREITBLEISTVERS	BO 009.0249	203.7995
B2	BO CA3020BREITBLEISTVERST	009.0232	203.8527
B3	BO TAA661B ZF-VERST-DEM	BO 009.1522	203.8504
B4	BO MC1460R SPANNUNGSREGL	BO 009.1297	203.6018
BU1	EINBAUBUCHSE SYST.BNC ENTH.IN 203.9275 (K2) FUER VAR 02,03,05 U.07 EINBAUBUCHSE SYST.TNC ENTH. IN 203.9275 (K2) FUER VAR 08 EINBAUBUCHSE SYST.BNC ENTH. IN 204.1210 (Y7) FUER VAR 04		203.6018
BU2	BUCHSE SUBMIN.27 ENTH. IN 203.9275 (K2) FUER VAR 02,03,05,07 U.08 BUCHSE SUBMIN.27 ENTH. IN 204.1210 (Y7) FUER VAR 04		203.6018
BU3	WINKELBUCHSE SUMBIN.27 ENTHALTEN IN 203.9300		203.7637
BU10	FJ W.K.BU.SMC F.UT-85 ENTH. IN 204.2500 (K12) FUER VAR 05	FJ 070.0339	203.6018
BU12	BUCHSE SUBMIN 27 ENTH. IN 204.0094		203.8233
BU13	BUCHSE SUBMIN 27 ENTH. IN 204.0094		203.8233
BU14	BUCHSE SUBMIN.27 ENTH. IN 204.1149 (K15)		203.6018
BU15	EINBAUBUCHSE SYST.BNC ENTH.IN 204.1149 (K15) FUER VAR 02,03,04,05 U.07 EINBAUBUCHSE SYST.TNC ENTHALTEN IN 204.1149(K15) FUER VAR 08		203.6018
BU16	FM BUCHSENLEISTE 10POL.	FM 018.4866	203.6018
BU19	FT KOPFHOERERBUCHSE 3,5	FT 084.6457	203.6018
BU21	FT TELEFONBU.ISOLIERTGRAUZ	FT 018.3001	203.6018
BU22	BUCHSE ISOLIERT Z FUER VAR 02,03,05,07U.08	204.0820	203.6018
BU23	BUCHSE ISOLIERT Z FUER VAR 02,03,05,07 U.08	204.0820	203.6018
BU24	FT TELEFONBU.ISOLIERTGRAUZ FUER VAR 04	FT 018.3001	203.6018

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	02

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
BU25	FT TELEFONB.GEERDET GRAU Z FUER VAR 04	FT 018.3147	203.6018
BU26	FJ EINBAUBUCHSE SYST.BNC ENTH. IN 204.2500 (K12) FUER VAR 05	FJ 017.6636	203.6018
C1	CE 47MF16V12X7X11TA	023.5967	203.7714
C2	CC 27NF+-10%50V3K6000CHIP	082.3609	203.7714
C3	CE 22 MF 15V 8X5X11TA/QUA	CE 022.8091	203.7714
C4	CC 27NF+-10%50V3K6000CHIP	082.3609	203.7714
C5	CK 22NF+-20%400V QUADER	CK 006.5233	203.7714
C6	CK 680NF+-20%100V QUADER	CK 006.5085	203.7714
C7	CC 22 NF 8100% HDK6000	CC 022.0684	203.7714
C8	CK 10NF+-20%400V QUADER	CK 006.5227	203.7714
C9	CT 9,5PF N470 ABGL.OBEN	080.0625	203.7714
C10	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.7637
C11	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.7637
C12	CC 1PF+-0,5PF5P100	CC 006.0025	203.7637
C20	DREHKONDENSATOR Z	203.6499	203.6118
C21	DREHKO ENTH. IN 203.6124		203.6124
C22	CC 680PF+50-20%5HDK4000	CC 006.0483	203.6276
C23	CE 4,7MF35V 8X 5X11TA/QUA	CE 022.8204	203.6276
C24	CC 680PF+50-20%5HDK4000	CC 006.0483	203.6276
C25	CC 680PF+50-20%5HDK4000	CC 006.0483	203.6276
C26	CC 220PF+-20% HDK2000 RD5	CC 006.0454	203.6818
C27	KONDENSATOR	204.0213	203.6818
C28	CC 11,3PF 2% NPO/IB 8CHIP	CC 022.4573	203.8010
C29	CC 82PF+- 5%100V NPO VIEL	CC 060.0765	203.8010
C30	CC 22 PF 2% N150/IB8 CHIP	CC 022.4773	203.8010
C31	CC 68PF+- 5%100V NPO VIEL	CC 060.0759	203.8010
C32	CC 22 PF 2% N150/IB8 CHIP	CC 022.4773	203.8010
C33	CC 82PF+- 5%100V NPO VIEL	CC 060.0765	203.8010
C34	CC 11,3PF 2% NPO/IB 8CHIP	CC 022.4573	203.8010
C35	CC 2 PF+-0,5 PF5P100	CC 006.0048	203.8010
C60	KAPAZITAET ENTH. IN 203.6124		203.6124
C61	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.6124
C62	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.6124
C63	CC 4,7NF+-20%100V3K1200 C	022.4450	203.6318
C65	CT 1,5PF TEFLONFOLTR.4X12	252.5663	203.6124
C66	CE 4,7MF35V 8X 5X11TA/QUA	CE 022.8204	203.6276
C67	CC 2 PF+-0,5 PF5P100	CC 006.0048	203.6318
C69	CC 4 PF+-0,5PF5N033	CC 006.0125	203.7466
F C69	CC 6 PF+-0,5PF N033 TRIMMWERT	CC 006.0148	203.7466
C70	CC 18PF 5% N750/IB RD5 TRIMMWERT	CC 006.0354	203.8156
C71	CC 8PF+-0,5PF N150/IB RD5 TRIMMWERT	CC 006.0248	203.8156
C72	CT 3PF TAUCHTR. RD 3,6X13	037.7121	203.8156
C73	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8156
C74	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8156
C75	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8156
C76	CC 4 PF+-0,5PF5N033	CC 006.0125	203.8156

unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	03

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C77	CE 470NF35V RD 4X 8 TA	CE 006.3224	203.7466
C79	CC 680PF+50-20%5HDK4000	CC 006.0483	203.7466
C80	CC 4 PF+-0,5PF5N033	CC 006.0125	203.7466
C81	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.7466
C82	CC 6PF+-0,5PF N150/IB RD5	CC 006.0225	203.7466
C83	CC 4 PF+-0,5PF5N033	CC 006.0125	203.7466
C84	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.7466
C85	CC 6PF+-0,5PF N150/IB RD5	CC 006.0225	203.7466
C86	CC 4 PF+-0,5PF5N033	CC 006.0125	203.7466
C87	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.7466
C88	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	203.7466
C89	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.7466
C90	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.7466
C91	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.7466
C93	CK 220NF+-20% 63V RD 6X22	CK 024.8282	203.6018
C94	CE 1MF34V 5X 4X 7TA/QUAD	CE 022.8185	203.7995
C95	CE 10MF25V 7X5X11 TA	023.5980	203.7995
C96	CK 220NF+-20%100V QUADER	CK 006.5056	203.7995
C97	CE 4,7MF35V 8X 5X11TA/QUA	CE 022.8204	203.7995
C98	CK 220NF+-20%100V QUADER	CK 006.5056	203.7995
C99	CE 4,7MF35V 8X 5X11TA/QUA	CE 022.8204	203.7995
C100	CE 47MF16V12X7X11TA	023.5967	203.7995
C101	CC 220PF+-20% HDK2000 RD5	CC 006.0454	203.6018
C102	CK 2,2MF+-20%100V RD11X26	CK 024.8453	203.6018
C105	CT 15,5PF N750 ABGL OBEN	065.9677	203.8391
C106	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8391
C107	CC 22PF 5% N750/IB RD5	CC 006.0360	203.8391
C108	CT 15,5PF N750 ABGL OBEN	065.9677	203.8391
C109	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8391
C111	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8391
C114	CT 15,5PF N750 ABGL OBEN	065.9677	203.8379
C115	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8379
C116	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8379
C117	CT 35PF N1500 LIEG.ABGL.	069.0568	203.8379
C118	CC 10NF+80-20%HDK6000	CC 022.0632	203.8379
C119	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8379
C120	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8379
C121	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8379
C122	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8356
C123	CC 10NF+80-20%HDK6000	CC 022.0632	203.8379
C126	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C127	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C128	CC 10NF+80-20%HDK6000	CC 022.0632	203.8356
C129	CT 15,5PF N750 ABGL OBEN	065.9677	203.8356
C130	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C131	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8356
C132	CC 10NF+80-20%HDK6000	CC 022.0632	203.8356
C133	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C134	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C135	CC 10NF+80-20%HDK6000	CC 022.0632	203.8356
C136	CC 10NF+80-20%HDK6000	CC 022.0632	203.8356
C137	CT 15,5PF N750 ABGL OBEN	065.9677	203.8356
C138	CC 2,2NF+50-20%9HDK4000	CC 006.0502	203.8356
C139	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8356
C142	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.8233
C143	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.8233
C144	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C145	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233
C146	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233
C147 BIS C149	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.8233
C152	CC 0,5PF+-0,25PF5P100	CC 006.0019	203.8527
F C152	CC 1PF+-0,5PF5P100	CC 006.0025	203.8527
F C152	CC 1,5PF+-0,5 PF5P100	CC 006.0031	203.8527
F C152	CC 2 PF+-0,5 PF5P100 TRIMMWERT	CC 006.0048	203.8527
C153	CC 0,5PF+-0,25PF5P100	CC 006.0019	203.8527
C154	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8527
C155	CT 35PF N1500 LIEG.ABGL.	069.0568	203.8527
C156	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8527
C157	CC 10NF+80-20%HDK6000	CC 022.0632	203.8527
C158	CC 10NF+80-20%HDK6000	CC 022.0632	203.8527
C159	CT 15,5PF N750 ABGL OBEN	065.9677	203.8527
C160	CC 100NF+-20%100V K6000VI	CC 060.1326	203.8527
C163	CC 10NF+80-20%HDK6000	CC 022.0632	203.8540
C164	CC 10NF+80-20%HDK6000	CC 022.0632	203.8540
C165	CC 100PF+-20% HDK700 RD5	CC 006.0431	203.8540
C166	CC 100PF+-20% HDK700 RD5	CC 006.0431	203.8540
C167	CE 4,7MF10V 5X 4X 7TA	CE 022.8056	203.8540
C168	CC 10NF+80-20%HDK6000	CC 022.0632	203.8540
C169	CC 22PF 5% N750/IB RD5	CC 006.0360	203.8540
C170	CC 100PF+-20% HDK700 RD5	CC 006.0431	203.8540
C171	CC 100PF+-20% HDK700 RD5	CC 006.0431	203.8540
C172	CC 10NF+80-20%HDK6000	CC 022.0632	203.8540
C175	CC 1 NF+50-20%5HDK4000	CC 006.0490	203.8504
C176	CC 10NF+80-20%HDK6000	CC 022.0632	203.8504
C177	CC 10NF+80-20%HDK6000	CC 022.0632	203.8504
C178	CC 5 PF+-0,5PF5N033	CC 006.0131	203.8504
C179	CC 4,7NF+80-20%HDK6000	CC 022.0626	203.8504
C180	CT 9,5PF N470 ABGL.OBEN	080.0625	203.8504
C181	CC 27PF 2% NP0/IB 3ROHR	CC 006.1244	203.8504
C182	CC 10NF+80-20%HDK6000	CC 022.0632	203.8504
C184	CC 10NF+80-20%HDK6000	CC 022.0632	203.8504
C185	CK 22NF+-20%400V QUADER	CK 006.5233	203.8504
C186	CK 100NF+-20%100V QUADER	CK 006.5033	203.8504
C187	CK 100NF+-20%100V QUADER	CK 006.5033	203.8504
C188	CK 220NF+-20%100V QUADER	CK 006.5056	203.8504
C189	CC 10NF+80-20%HDK6000	CC 022.0632	203.8504
C190	CE 4,7MF10V 5X 4X 7TA	CE 022.8056	203.8504
C193 BIS C199	CB 2,2NF-20+50% HDK4000DF	CB 023.0159	203.8233
C200	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233
C201	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233
C202	CB 1NF-20+80%HDK4000DF-KO	069.0551	203.8233
C205	CE 10MF25V 7X5X11 TA	023.5980	204.1110
C206	CC 10NF+80-20%HDK6000	CC 022.0632	204.1110
C207	CK 100NF+-20%100V QUADER	CK 006.5033	204.1110
C208	CC 1 NF+50-20%5HDK4000	CC 006.0490	204.1110
C209	CE 10MF25V 7X5X11 TA	023.5980	204.1110
C210	CC 1 NF+50-20%5HDK4000	CC 006.0490	204.1110
C211	CE 1MF34V 5X 4X 7TA/QUAD	CE 022.8185	204.1110
C212	CE 470MF-20850%63V21RDX40	CE 022.7908	203.6018

und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	05

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C213	CE 10MF25V 7X5X11 TA	023.5980	204.1110
C214	CC 10NF+80-20%HDK6000	CC 022.0632	204.1110
C215	CC 1 NF+50-20%5HDK4000	CC 006.0490	203.6018
C216	CE 33MF 10V RD 5X13TA	CE 006.3053	204.1110
C231	CC 12PF 2,5% NPO/1B 3ROHR	CC 006.1209	203.8391
C232	CC 12PF 2,5% NPO/1B 3ROHR	CC 006.1209	203.8391
C233	CC 22PF 2% NPO/1B 3ROHR	CC 006.1238	203.8379
	ENTFAELLT FUER VAR 05		
C234	CC 33PF 2% NPO/1B 3ROHR	CC 006.1250	203.8379
	FUER VAR 05		
	12 PF 2,5 % NPO/1B		
	ENTHALTEN IN 204.1755		
C235	CC 10NF+80-20%HDK6000	CC 022.0632	203.8233
C240	CC 4,7NF+80-20%HDK6000	CC 022.0626	204.1410
C241	CC 4,7NF+80-20%HDK6000	CC 022.0626	204.1410
C250	CE 4,7MF35V 8X 5X11TA/QUA	CE 022.8204	203.6276
D1	LD 75 DB (800MHZ)2X800 PF	LD 006.8049	203.6124
D2	LD 75 DB (800MHZ)2X800 PF	LD 006.8049	203.6124
D3	LD 75 DB (800MHZ)2X800 PF	LD 006.8049	203.7466
D6	LD 16 DB (20MHZ)2X2500 PF	LD 006.8078	203.6018
D7	LD 16 DB (20MHZ)2X2500 PF	LD 006.8078	203.6018
GL1	AD 1N4151 ERSATZ F.1N4154	012.0552	203.7714
GL2	AE 0180 50V SI STEP-REC.D	AE 012.9443	203.7714
GL4	AE BA121SI30V15/4PFKAP	AE 012.6121	203.8156
GL6	AD 16P1GE150V150MIA	012.0430	203.8540
	TRIMMWERT		
GL7	AE ZPD4,3 Z-DIODE 5%	AE 012.2426	203.8540
GL8	AD 1N4151 ERSATZ F.1N4154	012.0552	203.8540
GL9	AD 1N4151 ERSATZ F.1N4154	012.0552	203.8540
GL12	AG 1N4001 SI 1A 50V	013.0033	204.1110
GL13	AE BZX79/C5V6 Z-DIODE 5%	AE 012.2455	204.1110
GL14	AE BZX79/C6V8 Z-DIODE 5%	AE 012.2478	204.1110
GL15	AG 1N4001 SI 1A 50V	013.0033	204.1110
BIS			
GL18			
GL20	AD 1N4448 SI 75V 150MIA	AD 012.0700	204.1110
GL21	AE BZX79/C6V8 Z-DIODE 5%	AE 012.2478	204.1110
GL22	AD 1N4448 SI 75V 150MIA	AD 012.0700	204.1110
J1	JD 40MA78X61U UNGEDAEMPFT	080.0760	203.6018
J2	JK ABSTIMMANZEIGE Z	105.8017	203.6018
K2	HF-KABEL Z	203.9275	203.6018
	FUER VAR 02,03,05,07 U.08		
K3	HF-KABEL Z	203.9300	203.7637
K4	HF-KABEL Z	203.6299	203.6118
K5	HF-KABEL Z	203.6347	203.6118
K7	HF-KABEL Z	203.9269	203.6118
K8	HF-KABEL Z	203.9252	203.6118
K9	HF-KABEL Z	203.9130	203.6118
K10	HF-KABEL Z	203.9100	204.0665
K12	HF-KABEL Z	204.2500	203.6018
	FUER VAR 05		
K13	HF-KABEL Z	203.9298	203.8233
K14	HF-KABEL Z	204.0107	203.8233

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Kennzeichen	Benennung / Beschreibung		Sachnummer	enthalten in
K15	HF-KABEL	Z	204.1149	203.6018
K16	HF-KABEL FUER VAR 04	Z	204.1132	203.6018
K90	KABEL FUER VAR 05	Z	204.1810	203.6018
K91	KABEL FUER VAR 05	Z	204.1826	203.6018
L3	SPULE		204.0388	203.7714
L4	SPULE	Z	204.1532	203.7637
L7	SPULE	Z	204.0236	203.6818
L8	SPULE	Z	204.0242	203.6818
L9	SPULE	Z	204.0259	203.6818
L10	SPULE	Z	204.0265	203.6818
L12	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.6276
L15	SPULE		203.8040	203.8010
L16	SPULE		203.8056	203.8010
L17	SPULE		203.8062	203.8010
L18	SPULE		203.8056	203.8010
L19	SPULE		203.8062	203.8010
L20	SPULE		203.8056	203.8010
L21	SPULE		203.8040	203.8010
L29	LF ROHRKERN RD3,5XRD1,2XL UEBER TR1 GE GESCHOBEN		LF 026.9257	203.8156
L40	DRAHT		203.7408	203.6124
L41	LD 0,47MH 10%0,82A0,350HM		LD 067.2828	203.6124
L42	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.6276
L43	DRAHT		203.7395	203.6124
L44	LD 0,68MH BEI1,63A0,150HM		LD 026.3759	203.7466
L45	LD 0,68MH BEI1,63A0,150HM		LD 026.3759	203.7466
L46	LD 0,68MH BEI1,63A0,150HM		LD 026.3759	203.7466
L47	KOPPELSPULE ENTH.IN 203.7466			203.7466
L48	KOPPELSPULE ENTH.IN 203.7466			203.7466
L49	KOPPELSPULE ENTH.IN 203.7466			203.7466
L50	LD 3,3MH BEI 1,63A0,160HM		LD 026.4061	203.6018
L51	SPULE	Z	204.0065	203.8391
L53	SPULE	Z	204.0071	203.8391
L54	LD 8,20MH 10% 0,3A 2,40HM		LD 067.2970	203.8379
L55	LD 8,2MH BEI 0,94A0,490HM		LD 026.4110	203.8379
L56	LD 2,2 MH BEI 0,6A 1,30HM		LD 026.3788	203.8379
L57	SPULE	Z	204.0088	203.8379
L58	LD 12MH BEI 0,62A 1,1 OHM		LD 026.4132	203.8356
L59	LD 2,2 MH BEI 0,6A 1,30HM		LD 026.3788	203.8356
L60	LD 12MH BEI 0,62A 1,1 OHM		LD 026.4132	203.8356
L61	LD 2,2 MH BEI 0,6A 1,30HM		LD 026.3788	203.8356
L62	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.8233
L63	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.8233
L64	SPULE	Z	204.0036	203.8527
L65	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.8527
L66	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.8540
L67	LD 15MH BEI 0,58A 1,3 OHM		LD 026.4149	203.8540

und schadenersatzpflichtig.

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
L68	LD 4,7MH BEI 1,35A0,240HM	LD 026.4084	203.8504
L69	LD 15MH BEI 0,58A 1,3 OHM	LD 026.4149	203.8504
L70	LD 15MH BEI 0,58A 1,3 OHM	LD 026.4149	203.8504
L71	LF ROHRKERN RD3,5XRD1,2XL UEBER LEITUNG GESCHOBEN	LF 026.9257	203.8233
L72	LD 15MH BEI 0,58A 1,3 OHM	LD 026.4149	203.8233
L75			203.7466
	INNENLEITER ENTH.IN 203.7466		
L76			203.7466
	INNENLEITER		
L77			203.7466
	INNENLEITER ENTH.IN 203.7466		
L78			203.7466
	INNENLEITER ENTH.IN 203.7466		
L79	LD 0,68MH BEI1,63A0,150HM	LD 026.3759	203.6018
LT1	EL LAUTSPRECHER	066.0696	203.6018
Q1	EQ 68,450MHZ (5.) HC-18/U	089.1699	203.8156
R1	RF 0,25W 10 OHM +-5%	RF 069.1006	203.7714
R2	RF 0,25W 15KOHM +-5%	RF 069.1535	203.7714
R3	RS 0,5W 1KOHM KURVE 1LIEG	RS 030.5669	203.7714
R4	RF 0,25W560 OHM +-5%	RF 069.5618	203.7714
R5	RF 0,25W 1KOHM +-5%	RF 069.1029	203.7714
R6	RS 0,5W 25KOHM KURVE1LIEG	RS 030.5723	203.7714
R7	RF 0,25W 15KOHM +-5%	RF 069.1535	203.7714
R8	RS 0,8W 2,5KOHMKURVE1LIEG	RS 030.6013	203.7714
R9	RF 0,25W390 OHM +-5%	RF 069.3915	203.7714
R10	RF 0,25W 68 OHM +-5% TRIMMWERT FUER VAR 05 100 OHM+-5% ENTHALTEN IN 204.1726	RF 069.6808	203.7714
R11	RF 0,25W200 OHM +-5% TRIMMWERT FUER VAR 05 75 OHM+-5% ENTHALTEN IN 204.1726	RF 069.2019	203.7714
R12	RF 0,25W 68 OHM +-5% TRIMMWERT FUER VAR 05 100 OHM+-5% ENTHALTEN IN 204.1726	RF 069.6808	203.7714
R13	RF 0,5 W 47 OHM+-5%	RF 007.1219	203.7714
R14	RF 0,25W4,7KOHM +-5%	RF 069.4728	203.7714
R15	RF 0,5 W 10 MOHM +-5%	RF 007.1854	203.7714
R17	RF 0,25W2,2KOHM +-5%	RF 069.2225	203.6818
R18	RF 0,25W3,3KOHM +-5%	RF 069.3321	203.6276
R25	RF 0,25W 10KOHM +-5%	RF 069.1035	203.7714
R26	RF 0,25W 33 OHM +-5% TRIMMWERT	RF 069.3309	203.7714
R27	RF 0,25W120 OHM +-5%	RF 069.1212	203.6318
R28	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.6318
R29	RF 0,25W 10 OHM +-5% TRIMMWERT	RF 069.1006	203.6124
R30	RF 0,25W2,2KOHM +-5%	RF 069.2225	203.6276

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	08

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R31	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.6124
R32	AW HEISSL500 OHM+-10%0,8W	AW 008.0080	203.6118
R33	RF 0,25W270 OHM +-5%	RF 069.2719	203.8156
R34	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.8156
R35	RF 0,25W6,8KOHM +-5%	RF 069.6820	203.8156
R36	RF 0,25W270 OHM +-5%	RF 069.2719	203.8156
R37	RF 0,25W8,2KOHM +-5%	RF 069.8223	203.8156
R38	RF 0,25W3,3KOHM +-5%	RF 069.3321	203.8156
R39	RF 0,25W100 OHM +-5%	RF 069.1012	203.6124
R41	RF 0,25W180 OHM +-5%	RF 069.1812	203.7466
R42	RF 0,25W270 OHM +-5%	RF 069.2719	203.7466
R43	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.7466
R44	RF 0,25W 10KOHM +-5%	RF 069.1035	203.7466
R45	RF 0,25W270 OHM +-5%	RF 069.2719	203.7466
R46	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.7466
R47	RF 0,25W 10KOHM +-5%	RF 069.1035	203.7466
R48	RF 0,25W270 OHM +-5%	RF 069.2719	203.7466
R51	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.7995
R52	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.7995
R53	RS 0,5W 10KOHM KURVE1STEH	RS 030.5852	203.7995
R54	RF 0,25W 10KOHM +-5%	RF 069.1035	203.7995
R55	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.7995
R56	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.7995
R57	RS 0,5W 5KOHM KURVE1STEH.	RS 030.5846	203.7995
R58	RF 0,25 W 22 KOHM +-2%	028.1699	203.7995
R59	RF 0,25W4,7KOHM +-5%	RF 069.4728	203.7995
R60	RF 0,25W 180KOHM+-2%	069.4105	203.7995
R61	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.7995
R62	RF 0,25W 15KOHM +-5%	RF 069.1535	203.7995
R63	RS 0,5W 25KOHM KURVE1STEH	RS 030.5875	203.7995
R64	RF 0,25W6,8KOHM +-5%	RF 069.6820	203.7995
R65	RF 0,25W 18KOHM +-5%	RF 069.1835	203.7995
	TRIMMWERT VAR 05, 06: RF 069.1029		
R66	RF 0,25W470KOHM +-5%	RF 069.4740	203.7995
R67	RF 0,25W 82KOHM +-5%	RF 069.8230	203.7995
R68	RF 0,25W680 OHM +-5%	RF 069.6814	203.7995
R69	RF 0,25W5,6KOHM +-5%	RF 069.5624	203.7995
R70	RF 0,5W 1 OHM+-5%	RF 007.1019	203.7995
R71	RF 0,5W 1 OHM+-5%	RF 007.1019	203.7995
R72	RF 0,25W 27 OHM +-5%	RF 069.2702	203.7995
R73	RF 0,5 W 82 OHM+-5%	RF 007.1248	203.7995
R77	RF 0,25W150KOHM +-5%	RF 069.1541	203.8391
R78	RF 0,25W100KOHM +-5%	RF 069.1041	203.8391
R79	RF 0,25W180 OHM +-5%	RF 069.1812	203.8391
R81	RF 0,25W3,9KOHM +-5%	RF 069.3921	203.8391
	FUER VAR 05 4,7KOHM+-5% ENTHALTEN IN 204.1778		
R84	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8379
	FUER VAR 05 1,8KOHM+-5% ENTHALTEN IN 204.1755		
R85	RF 0,25W100KOHM +-5%	RF 069.1041	203.8379
R86	RF 0,25W220 OHM +-5%	RF 069.2219	203.8379
R87	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8379
R88	RF 0,25 W 1 KOHM +-2%	RF 028.1524	203.8379
R89	RF 0,25W2,2KOHM +-5%	RF 069.2225	203.8379
R90	RF 0,25W4,7KOHM +-5%	RF 069.4728	203.8379

unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	09

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R91	RF 0,25W3,3KOHM +-5%	RF 069.3321	203.8379
R92	RF 0,25W100 OHM +-5%	RF 069.1012	203.8233
	TRIMMWERT		
R94	RF 0,25W270 OHM +-5%	RF 069.2719	203.8379
R95	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8233
R97	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R98	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8356
R99	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R100	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8356
R101	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R102	RF 0,25W470 OHM +-5%	RF 069.4711	203.8356
R103	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R104	RF 0,25W 68 OHM +-5%	RF 069.6808	203.8356
R105	RF 0,25W180 OHM +-5%	RF 069.1812	203.8356
R106	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8356
R109	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R110	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8356
R111	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R112	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8356
R113	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R114	RF 0,25W470 OHM +-5%	RF 069.4711	203.8356
R115	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8356
R116	RF 0,25 W 50 OHM +-2%	007.0812	203.8356
R120	RF 0,25W2,2KOHM +-5%	RF 069.2225	203.8527
R121	RF 0,25W270 OHM +-5%	RF 069.2719	203.8527
R122	RF 0,25W2,7KOHM +-5%	RF 069.2725	203.8527
R123	RF 0,25 W 50 OHM +-2%	007.0812	203.8527
R126	RF 0,25W 18 OHM +-5%	RF 069.1806	203.8540
R127	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8540
R128	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8540
R129	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8540
R130	RF 0,25W 12KOHM +-5%	RF 069.1235	203.8540
R131	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8540
R132	RF 0,25W6,8KOHM +-5%	RF 069.6820	203.8540
R133	RF 0,25W 82 OHM +-5%	RF 069.8200	203.8540
R134	RF 0,25W1,5KOHM +-5%	RF 069.1529	203.8540
R135	RS 0,5W 1KOHM KURVE 1LIEG	RS 030.5669	203.8540
R136	RF 0,25W 18KOHM +-5%	RF 069.1835	203.8540
R137	RF 0,25W1,5KOHM +-5%	RF 069.1529	203.8540
R138	RF 0,25W2,2KOHM +-5%	RF 069.2225	203.8540
R142	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8504
R143	RF 0,25W 18KOHM +-5%	RF 069.1835	203.8504
R144	RF 0,25W 2 MOHM +-5%	RF 069.2054	203.8504
	TRIMMWERT		
R145	RF 0,5 W 8,2 MOHM +-5%	RF 007.1848	203.8504
R146	RF 0,5 W 10 MOHM +-5%	RF 007.1854	203.8504
R147	RF 0,25W1,5MOHM +-5%	RF 069.1558	203.8504
R148	RS 0,5W2,5MOHM KURVE1PIN	030.5898	203.8504
R149	RF 0,25W 18KOHM +-5%	RF 069.1835	203.8504
R150	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8504
R151	RF 0,25W150KOHM +-5%	RF 069.1541	203.8504
R152	RS 0,5W250KOHM KURVE1LIEG	RS 030.5752	203.8504
R153	AW HEISSL500KOHM+-10%0,8W	AW 008.0168	203.8504
R154	AW HEISSL220KOHM+-20%0,05	AW 008.0374	203.8504
R155	RF 0,25W820KOHM +-5%	RF 069.8246	203.8504
R156	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.8933
	VAR 02		
	VAR 04 ENTH. IN 204.1310		
	ENTFAELLT BEI VAR 05		

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	10

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R157	RF 0,25W 18KOHM +-5% VAR 02,03,05,07 U.08 VAR 04 ENTH. IN 204.1310	RF 069.1835	203.8933
R158	RS 0,05W 25KOHM KURVE2L32 ACHS-L.=20	RS 066.9941	203.6018
R159	RF 0,25W 68KOHM +-5%	RF 069.6837	203.6018
R160	RS SCHICHTDREHWIDERSTAND ACHS-L.=20	203.7343	203.6018
R161	RF 0,25W2,7KOHM +-5% TRIMMWERT	RF 069.2725	203.6018
R163	RF 0,25W 10KOHM +-5% VAR 02,03,05,07 U.08 VAR 04 ENTH. IN 204.1310	RF 069.1035	203.8933
R164	RF 0,25W 1KOHM +-5%	RF 069.1029	203.8233
R166	RF 0,25W3,3KOHM +-5% TRIMMWERT	RF 069.3321	204.1110
R167	RF 0,25W8,2KOHM +-5%	RF 069.8223	204.1110
R169	RF 0,25W 3,3 OHM +-5%	RF 073.9995	204.1110
R171	RF 0,25 W 12 KOHM +-2%	028.1660	204.1110
R172	RF 0,25W100KOHM +-5% TRIMMWERT	RF 069.1041	204.1110
R173	RF 0,25 W 6,8 KOHM +-2%	028.1647	204.1110
R174	RF 0,25W 1 MOHM +-5%	RF 069.1058	204.1110
R175	RF 0,25W470KOHM +-5%	RF 069.4740	204.1110
R176	RF 0,25W820KOHM +-5% TRIMMWERT	RF 069.8246	204.1110
R178	RF 0,25W 39 OHM +-5%	RF 069.3909	204.1110
R179	RF 0,25 W 10 KOHM +-2%	RF 028.1653	204.1110
R180	RF 0,25W220KOHM +-5% TRIMMWERT	RF 069.2248	204.1110
R181	RF 0,25W 56KOHM +-5% TRIMMWERT	RF 069.5630	204.1110
R182	RF 0,25 W 12 KOHM +-2%	028.1660	204.1110
R183	RF 0,25W180KOHM +-5% TRIMMWERT	RF 069.1841	204.1110
R184	RF 0,25W 1KOHM +-5%	RF 069.1029	204.1110
R185	RF 0,25W2,7KOHM +-5%	RF 069.2725	204.1110
R186	RF 0,25W1,2KOHM +-5%	RF 069.1229	204.1110
R187	RF 0,25W2,2KOHM +-5%	RF 069.2225	204.1110
R188	RF 0,25W 1,3 OHM +-5%	RF 073.9908	204.1110
R189	RF 0,3W 4,7OHM +-5%	RF 028.1930	204.1110
R190	RF 0,25W 10 OHM +-5% TRIMMWERT	RF 069.1006	204.1110
R191	RF 0,25W2,2KOHM +-5%	RF 069.2225	204.1110
R192	RF 0,25W330 OHM +-5%	RF 069.3315	204.1110
R193	RF 0,25W 1KOHM +-5%	RF 069.1029	204.1110
R194	RF 0,25W 56KOHM +-5%	RF 069.5630	203.9181
R195	RF 0,25W 56KOHM +-5%	RF 069.5630	203.9181
R200	RF 0,25W1,5KOHM +-5%	RF 069.1529	204.1110
R201	RF 0,25W 22KOHM +-5%	RF 069.2231	204.1110
R203	TRIMMWERT WIDERST.0,25 W		203.8356
R204	RF 0,25W 56KOHM +-5% TRIMMWERT	RF 069.5630	203.8356
R205	RF 0,25W 10KOHM +-5% TRIMMWERT	RF 069.1035	203.8379
R207	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8233

und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	11

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R208	RF 0,25W 10KOHM +-5%	RF 069.1035	203.8233
R211	RF 0,25W 10KOHM +-5%	RF 069.1035	204.1410
R212	RF 0,25W 10KOHM +-5%	RF 069.1035	204.1410
R213	RF 0,25W1,2KOHM +-5%	RF 069.1229	203.6118
R220	RF 0,25W 12KOHM +-5%	RF 069.1235	203.6276
R231	RF 0,25W100 OHM +-5%	RF 069.1012	203.8010
RL1	EG SIGNALLEUCHTE ROT	EG 070.0751	203.6018
RSA	SR 12V 1MAL21	SR 063.7083	203.7714
S1	TEILERSCHALTER Z STROML.204.0571 S	204.0571	203.6018
S2	SM SM-TYPE AG-KONTAKTE	SM 020.6510	203.6024
S4	SB SCHALT.7T.4X21+1T.6X21 FUER VAR 02,03,05,07 U.08 SCHALT.AGG. 204.1332 FUER VAR 04 ENTH. IN 204.1310	070.5460	203.8933
S5	SB TASTER 21-21	020.4024	203.6018
S6	SCHALTEREBENE ENTH.IN 204.0571 (S1)		203.6018
S7	SD SPANNGSWAEHLER110/235V	063.6029	203.6018
S10	SB SCHALTER 21 MINIATUR FUER VAR 07	020.6785	203.6018
S11	SS SCHMELZ.MO,63CDIN41571 FUER 12V	SS 020.7375	203.6018
S12	SS SCHMEL.MO,16C DIN41571 FUER 220V	SS 020.7200	203.6018
S13	SS SCHMEL.MO,16C DIN41571 FUER 220V	SS 020.7200	203.6018
ST4	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.7643
ST5	FJ STECKER SUBMIN. 27 NUR FABRIKAT SPINNER	FJ 017.6265	203.8010
ST6	FJ STECKER SUBMIN. 27 NUR FABRIKAT SPINNER	FJ 017.6265	203.8010
ST10	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.7472
ST11	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.8240
ST12	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.8240
ST13	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.8410
ST17	FJ WINKELSTECKERSUBMIN.27	FJ 017.6288	203.8240
ST18	FN 3 POLIG GERAETESTECKERZ	FN 017.4691	203.6018
ST20	FJ EINBAUST.SMC IN.FL. LA	FJ 070.0151	203.6124
ST21	FM STECKERLEISTE 10POL.	FM 018.5127	204.1603
T1	AK 2N2369 NPN 40V 200MIA	AK 010.4680	203.7714
T2	AK 2N2369 NPN 40V 200MIA	AK 010.4680	203.7714
T3	AK BSY52 SINPN 60V 500MIA BEI R&S AUSGESUCHT"	204.1926	203.7714
T5	AK BFR35A SINPN 12V 4GHZ	911.0040	203.6318
T7	AK 2N918 SINPN 30V50 MIA	AK 010.4515	203.8156
T8	AK BFY90 SI NPN 30V50MIA	AK 010.4550	203.7466
T9	AK BFY90 SI NPN 30V50MIA	AK 010.4550	203.7466
T10	AK BFY90 SI NPN 30V50MIA	AK 010.4550	203.7466

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Kennzeichen	Benennung / Beschreibung		Sachnummer	enthalten in
T14	AM BF244A N-KANAL-FET 30V		010.8510	203.7995
T15	AM BF244A N-KANAL-FET 30V AUSGESUCHT NZ 204.0113		010.8510	203.7995
T17	AM 40673 DUAL-GATE-MOS-FE		AM 204.0859	203.8391
T18	AM 40673 DUAL-GATE-MOS-FE		AM 204.0859	203.8379
T19	AM 2N4859 N-KANAL-FET 30V		010.9081	203.8379
T20	AK 2N918 SINPN 30V50 MIA		AK 010.4515	203.8379
T21	AM BF244A N-KANAL-FET 30V AUSGESUCHT NZ 204.0113		010.8510	203.8356
T22	AM BF244A N-KANAL-FET 30V AUSGESUCHT NZ 204.0113		010.8510	203.8356
T23	AM BF244A N-KANAL-FET 30V		010.8510	203.8356
T24	AM BF244A N-KANAL-FET 30V		010.8510	203.8356
T25	AM BF244A N-KANAL-FET 30V AUSGESUCHT NZ 204.0113		010.8510	203.8356
T26	AM BF244A N-KANAL-FET 30V AUSGESUCHT NZ 204.0113		010.8510	203.8356
T27	AM BF244A N-KANAL-FET 30V		010.8510	203.8356
T28	AM BF244A N-KANAL-FET 30V		010.8510	203.8356
T30	AK 2N3866 SINPN 55V 0,4A		AK 010.0926	203.8540
T32	AK BC107A NPN 45V 100MIA		010.4950	204.1110
T33	AK BC107A NPN 45V 100MIA		010.4950	204.1110
T34	AL 2N3054 SINPN 90V 4A		AL 010.1051	203.6018
T35	AK BC107A NPN 45V 100MIA		010.4950	204.1110
T36	AK BC177A PNP 45V 100MIA		010.3254	204.1110
T37	AK BC 161-16 SI PNP60V 1A		080.8055	204.1110
T38	AK BC109C SINPN 20V100MIA		010.4415	204.1110
TR1	UEBERTRAGER	Z	204.0413	203.8156
TR2	NF-UEBERTRAGER	Z	203.9230	203.7995
TR3	UEBERTRAGER	Z	204.1855	203.8527
TR4	UEBERTRAGER	Z	204.1861	203.8540
TR5	NETZTRAFO	Z	203.9181	203.6018
X1	EP 10,7MHZ-BANDP.B:126KHZ FUER VAR 02, 03, 04 QUARZFILTER 114.9558 FUER VAR 05		058.3454	203.8233
Y1	ANTENNE MITZULIEF.ZUBEHOER	Z	203.7108	203.6018
Y2	HF-UMSCHALTUNG STROML. 203.6660 S	Z	203.6660	203.6818
Y3	HF-UMSCHALTUNG STROML. 203.6660 S	Z	203.6660	203.6818
Y6	STOERBEWERTUNGSZUSATZ FUER VAR 03, 07 U.08	Z	203.9317	203.6018
Y7	BREITBAND-UEBERTRAGER HIERZU STROML.204.1210 S FUER VAR 04	Z	204.1210	203.6018
Y8	TIEFPASS HIERZU STROML.204.1355 S FUER VAR 04	Z	204.1355	203.6018
Y9	SQUELCH-PLATINE HIERZU STROML.204.1632 S	Z	204.1632	204.1603
Y10	AFC-PLATINE HIERZU STROML. 204.2316 S FUER VAR 05 U.07	Z	204.2316	204.2300

und schädlichen Ersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	34	0476	VHF-FELDSTAERKEMESSER HFV	203.6018 SA	13

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
Y11	1 ZF-TEIL Z STROM.SIEHE 203.6018 S BL2 FUER VAR 02,03,04,07 U.08 1.ZF-TEIL 204.2416 STROM.SIEHE 203.6018 S BL3 FUER VAR 05 ENDE	203.7737	203.6118

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	00	12.7?	HF-UMSCHALTUNG	203.6660 SA	001

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	HF-UMSCHALTUNG Z STROML.203.6660 S -/-	203.6660	203.6660
C13	680PF+50-20% HDK4000 RD5	CC 006.0483	203.6660
C14	680PF+50-20% HDK4000 RD5	CC 006.0483	203.6660
C15	680PF+50-20% HDK4000 RD5	CC 006.0483	203.6660
RSB	12V 1MAL21 RHODIUM	SR 063.4832 ENDE	203.6660

und Schadenersatzpflicht.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	06	1274	ANTENNE	203.7108 SA	01

Kennzeichen	Benennung / Beschreibung		Sachnummer	enthalten in
A	ANTENNE STROMLAUF 203.7108 S	Z	203.7108	203.7108
K351	KABEL	Z	203.7295	203.7214
ST351	STECKER SYST.BNC BEI VAR 02,03,04,05 U.07 ENTH. IN 203.7295 (K351) STECKER SYST.TNC BEI VAR 08 ENTH. IN 203.7295 (K351)			203.7214
TR351	SYMMETRIERUEBERTRAGER	Z	203.7243	203.7214
	ENDE			

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	01	0872	MISCHER	203.7950 SA	01

Kennzeichen	Benennung / Beschreibung		Sachnummer	enthalten in
A	MISCHER	Z	203.7950	203.7950
	STROMLAUF 203,7950 S -/-			
C1	2,5NF+100-20%HDK4000TRAP		CC 022.0249	203.7950
C2	2,5NF+100-20%HDK4000TRAP		CC 022.0249	203.7950
GL1	TIV305 GE 8V SCHOTTKY-BAR		AE 012.9014	203.7950
GL2	TIV305 GE 8V SCHOTTKY-BAR		AE 012.9014	203.7950
R1	0,3W 4,7OHM +-5%		RF 028.1930	203.7950
ST1	STECKER	Z	204.0813	203.7950
TR1	UEBERTRAGER	Z	110.3432	203.7950
TR2	SYMMETRIERUEBERTRAGER	Z	110.1900	203.7950
		ENDE		

und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	01	1071	TEILERSCHALTER	204.0571 SA	01

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	TEILERSCHALTER Z STROML.204.0571 S +/=	204.0571	204.0571
R1	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R2	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R3	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R4	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R5	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R6	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R7	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R8	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R9	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R10	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R11	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R12	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R13	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R14	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R15	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R16	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R17	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R18	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R19	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R20	0,1 W 71,1 OHM +=1%	KF 027.9044	204.0571
R21	0,1 W 96,3 OHM +=1%	KF 027.9109	204.0571
R22	0,25 W 50 OHM +=2%	KF 007.0812	204.0571
S1	HF=TEILERSCH. 9STUFEN SUB	SH 070.7656	204.0571
S6	SCHALTEREBENE ENTH. IN SH 070.7656 (S1)		204.0571
ST2	EINBAUSTECKER SUBMIN, 27	FJ 017.6236	204.0571
ST3	EINBAUSTECKER SUBMIN, 27	FJ 017.6236	204.0571
	ENDE		

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	01	0974	SQUELCH-PLATINE	204.1632 SA	01

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	SQUELCH-PLATINE Z STROMLAUF 204.1632 S	204.1632	204.1632
B1	BO MA741 -55+125 99 OP.	BO 009.1251	204.1632
C1	CK 1MF+-10%100V QUADER	CK 006.5091	204.1632
C2	CK 47NF+-20%250V QUADER	CK 006.5162	204.1632
R1	RF 0,25W 47KOHM +-5%	RF 069.4734	204.1632
R2	RF 0,25W470 OHM +-5%	RF 069.4711	204.1632
R3	RF 0,25W470 OHM +-5%	RF 069.4711	204.1632
R4	RF 0,25W 10KOHM +-5%	RF 069.1035	204.1632
R5	RS 0,8W2,5KOHM KURVE1STEH	RS 030.6188	204.1632
R6	RF 0,25W1,8KOHM +-5%	RF 069.1829	204.1632
R7	RF 0,25W1,8KOHM +-5%	RF 069.1829	204.1632
R8	RF 0,25W 1 MOHM +-5%	RF 069.1058	204.1632
R9	RF 0,25W100KOHM +-5%	RF 069.1041	204.1632
R10	RF 0,25W 22 OHM +-5%	RF 069.2202	204.1632
R11	RS 0,5W10KOHM+-20%LIN PIN	RS 066.8839	204.1632
RSC	SR 12V 2MAL21	SR 063.6635	204.1632
T1	AM BF245B N-KANAL-FET 30V	010.8627	204.1632
T2	AM BF245B N-KANAL-FET 30V	010.8627	204.1632
	ENDE		

und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	00	0974	AFC-PLATINE	204.2316 SA	01

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	AFC-PLATINE Z STROMLAUF 204.2316 S	204.2316	204.2316
B1	BO MA741C -0+70 OP-VERST	BO 009.1300	204.2316
C1	CK 220NF+-20%100V QUADER	CK 006.5056	204.2316
C2	CE 100MF 16V RD11X13 TOPF	CE 022.7550	204.2316
R1	RS 0,5W100KOHM KURVE1LIEG	RS 030.5746	204.2316
R2	RF 0,25W 27KOHM +-5%	RF 069.2731	204.2316
R3	RF 0,25W 47KOHM +-5%	RF 069.4734	204.2316
R4	RF 0,25W 47KOHM +-5%	RF 069.4734	204.2316
R5	RF 0,25W 47KOHM +-5%	RF 069.4734	204.2316
R6	RF 0,25W680KOHM +-5%	RF 069.6843	204.2316
R7	RF 0,25W 1 MOHM +-5% TRIMMWERT	RF 069.1058	204.2316
R8	RF 0,25W4,7KOHM +-5%	RF 069.4728	204.2316
R9	RF 0,25W4,7KOHM +-5%	RF 069.4728	204.2316
R10	RS 0,5W 10KOHM KURVE1LIEG	RS 030.5700	204.2316
R11	RF 0,25W2,2KOHM +-5%	RF 069.2225	204.2316
R12	RF 0,25W2,2KOHM +-5%	RF 069.2225	204.2316
	ENDE		

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ
MÜNCHEN

ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
01	0974	1.ZF-TEIL	204.2416 SA	111

Kennzeichen	Benennung / Beschreibung	Sachnummer	erhalten in
A	1.ZF-TEIL Z	204.2416	204.2416
	STROM.SIEHE 203.6018 S BL3		
BU11			204.2416
	BUCHSE SUBMIN.27		
	ENTHALTEN IN 203.6260(K11)		
C36	CC 4 PF+-0,5PF5N033	CC 006.0125	204.2416
C37	CC 0,5PF+-0,25PF5P100	CC 006.0019	204.2416
C38	CC 22PF 2% NP0/1B 3ROHR	CC 006.1238	204.2416
C39	KONDENSATOR	204.0213	204.2416
C40	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	204.2416
C41	CC 680 PF R4000 5 CHIP	CC 022.4850	204.2416
C42	CT 9,2PF TAUCHTR.RD 7X12	CT 025.7367	204.2416
C43	CC 2PF+-0,5PF5N150	CC 006.0183	204.2416
C44	CC 2 PF+-0,5 PF5P100	CC 006.0048	204.2416
C45	KONDENSATOR	204.0688	204.2416
C46	CC 680 PF R4000 5 CHIP	CC 022.4850	204.2416
C49	CT 4,3PF NORMAL 11X12	CT 025.6560	204.2416
C50	CT 4,3PF NORMAL 11X12	CT 025.6560	204.2416
C52	CC 5 PF+-0,5PF5N033	CC 006.0131	204.2416
C53	CC 4,7NF+100% HDK6000	CC 022.0661	204.2416
C54	CC 220PF 2% N750/1B 3ROHR	CC 006.1638	204.2416
C55	CC 220PF 2% N750/1B 3ROHR	CC 006.1638	204.2416
D4	LD 75 DB (800MHZ)2X800 PF	LD 006.8049	204.2416
D5	LD 75 DB (800MHZ)2X800 PF	LD 006.8049	204.2416
K6	HF-KABEL Z	204.2422	204.2416
K11	HF-KABEL Z	203.6260	204.2416
L22	SPULE	204.1278	204.2416
L23			204.2416
	ENTHALTEN IN 204.2416		
L24	SPULE	204.0794	204.2416
L25	SPULE	204.0136	204.2416
L26	SPULE	204.0142	204.2416
L27	SPULE	204.0159	204.2416
L28	INNENLEITER	203.7989	204.2416
L30	SPULE Z	204.0165	204.2416
L31	SPULE	204.0188	204.2416
L32	SPULE	204.0194	204.2416
L33	SPULE	204.0188	204.2416
L34	SPULE	204.0194	204.2416
L35	SPULE	204.0207	204.2416
L36	SPULE	204.0207	204.2416
L37	LD 1 MH BEI 1,15A 0,360HM	LD 026.3765	204.2416
L38	LD 1 MH BEI 1,15A 0,360HM	LD 026.3765	204.2416
L231	SPULE	204.2480	204.2416
R19	RF 0,25W470 OHM +-5%	RF 069.4711	204.2416
R20	RF 0,25W 51 OHM +-5%	RF 069.5101	204.2416
R21	RF 0,25 W 56 KOHM +-5%	RF 007.0464	204.2416
R22	RF 0,25 W 8,2 KOHM +-5%	RF 007.0364	204.2416
R23	RF 0,25W100 OHM +-5%	RF 069.1012	204.2416
R24	RF 0,25 W 82 KOHM +-5%	RF 007.0487	204.2416
	TRIMMWERT		

unbefugte Verwertung, Mitteilung an Dritte, Nachdruck und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	01	0974	1.ZF-TEIL	204.2416 SA	02

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
ST7	FJ EINBAUSTECKERSUBMIN.27	FJ 017.6236	204.2416
T12	AM 3N204 DUAL-MOSFET	AM 204.1910	204.2416
Y4	MISCHER Z HIERZU STROML.204.2451 S	204.2451	204.2416
Y5	MISCHER Z HIERZU STROML.203.7950 S	203.7950	204.2416
	ENDE		

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	00	0974	MISCHER	204.2451 SA	01

Kennzeichen	Benennung / Beschreibung		Sachnummer	enthalten in
A	MISCHER STROMLAUF 204.2451 S	Z	204.2451	204.2451
C1	CC 2,5NF+100-20%HDK4000TR		CC 022.0249	204.2451
C2	CC 2,5NF+100-20%HDK4000TR		CC 022.0249	204.2451
GL1	AE HPA2817 ERSETZT TIV305		012.9014	204.2451
GL2	AE HPA2817 ERSETZT TIV305		012.9014	204.2451
L1	SPULE		204.2474	204.2451
R1	RF 0,3W 4,70HM +-5%		RF 028.1930	204.2451
R2	RF 0,25W120 OHM +-5%		RF 069.1212	204.2451
ST1	STECKER	Z	204.0813	204.2451
TR1	UEBERTRAGER	Z	110.3432	204.2451
TR2	SYMMETRIERUEBERTRAGER	Z	110.1900	204.2451
	ENDE			

und schadenersatzpflichtig.

ROHDE & SCHWARZ
MÜNCHEN

Stromläufe
Bestückungspläne
Circuit diagrams
Components plans

R 29500 Bl. 4

Aufstellung der Stromläufe und Bestückungspläne

LIST OF CIRCUIT DIAGRAMS AND COMPONENTS PLANS

Gruppe SUB-ASSY.	Benennung DESIGNATION	Zeichnungs-Nr. DRAWING No.	
		Stromlauf CIRCUIT DIAGRAM	Bestückung COMPONENTS
Y1	Antenne	203.7108 S	203.7108
S1	Eingangsspg.-Teiler	204.0571 S	204.0571
	Pulsgenerator	203.6018 S Bl.3	204.1726 Bl.1 + 2
Y2-Y3	HF-Umschaltung	203.6660 S	203.6660
	Bandfilter	203.6018 S Bl.3	203.8027 Bl. 1 + 2
	HF-Umschaltung	"	203.6276
	1. Oszillator	"	203.6318 Bl. 1 + 2
	2. Oszillator	"	203.8156
Y4	1. Mischer	204.2451 S	204.2451
Y5	2. Mischer	203.7950 S	203.7950
Y9	Squelch-Platine	204.1632 S	204.1632 Bl.1 + 2
Y10	AFC-Platine	204.2316 S	204.2316 Bl.1 + 2
Y11	1. ZF-Verstärker	203.6018 S Bl.3	204.2416 Bl.1 + 2
	Buchsen RECORD	"	204.1410 Bl.1 + 2
	Anzeige-NF-Verstärker	"	203.7995
	2. Vorverstärker	"	204.1778
	Endverstärker	"	203.8527
	FM-Demodulator	"	203.8504 Bl.1 + 2
	AM-Demodulator	"	203.8540
	2. ZF-Verstärker	"	204.1755
	LOG-Verstärker	"	203.8356
	Stromversorgung	"	204.1110

Gerätevarianten

Bauteil \ VAR	02	03	04	05	07	08			
Stromlauf Bl. Nr.	2	2	2	3	2	2			
Frontplatte Nr.	203.8962 Z	203.8962 Z	204.0971 Z	204.0994 Z	204.2574 Z	203.8962 Z			
Schalter (S4) Nr.	203.8933 Z	203.8933 Z	204.1310 Z	203.8933 Z	203.8933 Z	203.8933 Z			
Y 6	—	X	—	—	X	X			
Y 7	—	—	X	—	—	—			
Y 8	—	—	X	—	—	—			
Y 9	—	—	—	X	—	—			
BU 22	X	X	—	X	X	X			
BU 23	X	X	—	X	X	X			
BU 24	—	—	X	—	—	—			
BU 25	—	—	X	—	—	—			
BU 26	—	—	—	X	—	—			
K 2	X	X	—	X	X	X			
K 16	—	—	X	—	—	—			
K 12	—	—	—	X	—	—			
Y 10	—	—	—	X	X	—			
204.2416 (Y11)	—	—	—	X	—	—			
203.8379	X	X	X	—	X	X			
203.8391	X	X	X	—	X	X			
203.7714	X	X	X	—	X	X			
204.1726	—	—	—	X	—	—			
204.1755	—	—	—	X	—	—			
204.1778	—	—	—	X	—	—			
204.1410	X	X	—	X	X	X			
203.7737 (Y11)	X	X	X	—	X	X			
S 10	—	—	—	—	X	—			

Benennung

bei VAR 02, 03, 07 u. 08:

VHF- Feldstärkemesser

Benennung

bei VAR 04 u. 05:

VHF - Meßempfänger

X = in der VAR eingebaut

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Änd zust	Änd.-Mittlg Nr	Datum	Name
L	17900	07.73	SL
M	17944	08.73	SL
P	19001	08.74	NL
Q	19347	11.74	RE

Iso-Prof. Math. E

Halbzeug, Werkstoff

Maßstab

Untol. Maße

Benennung VHF - Feldstärkemesser HFV | Z

Zeichnung besteht aus 3 Blatt | Blatt-Nr. 1

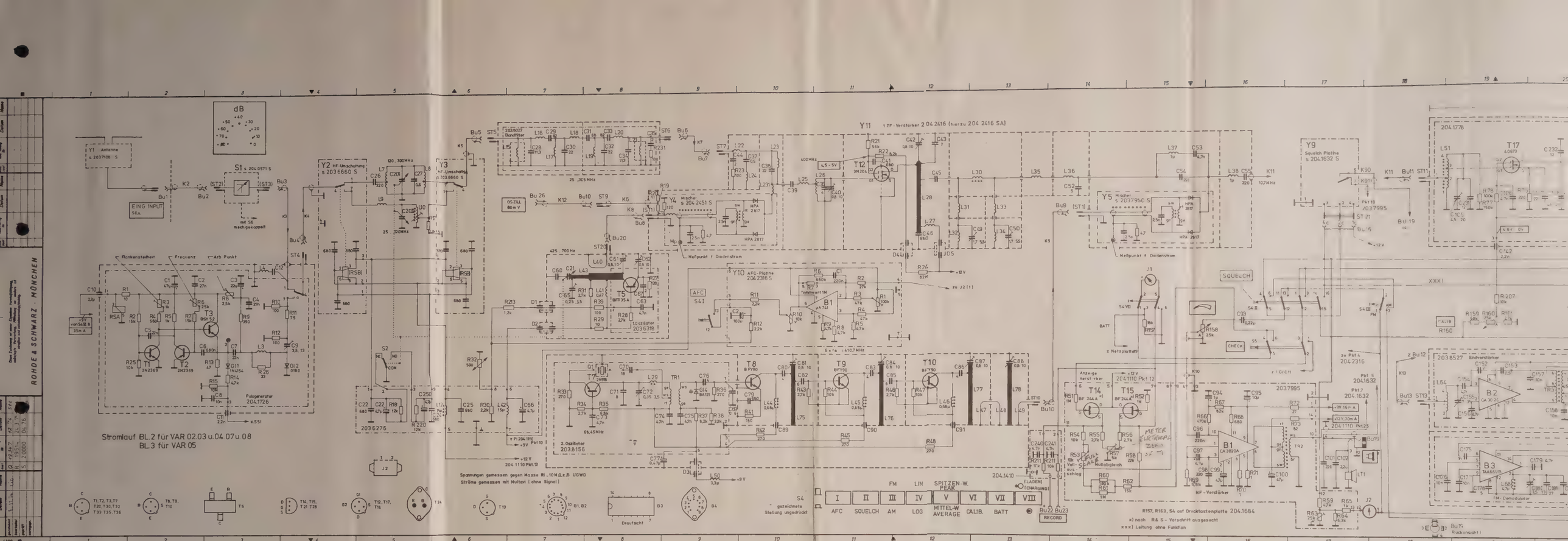
registr. in Verz. 203.6018 V

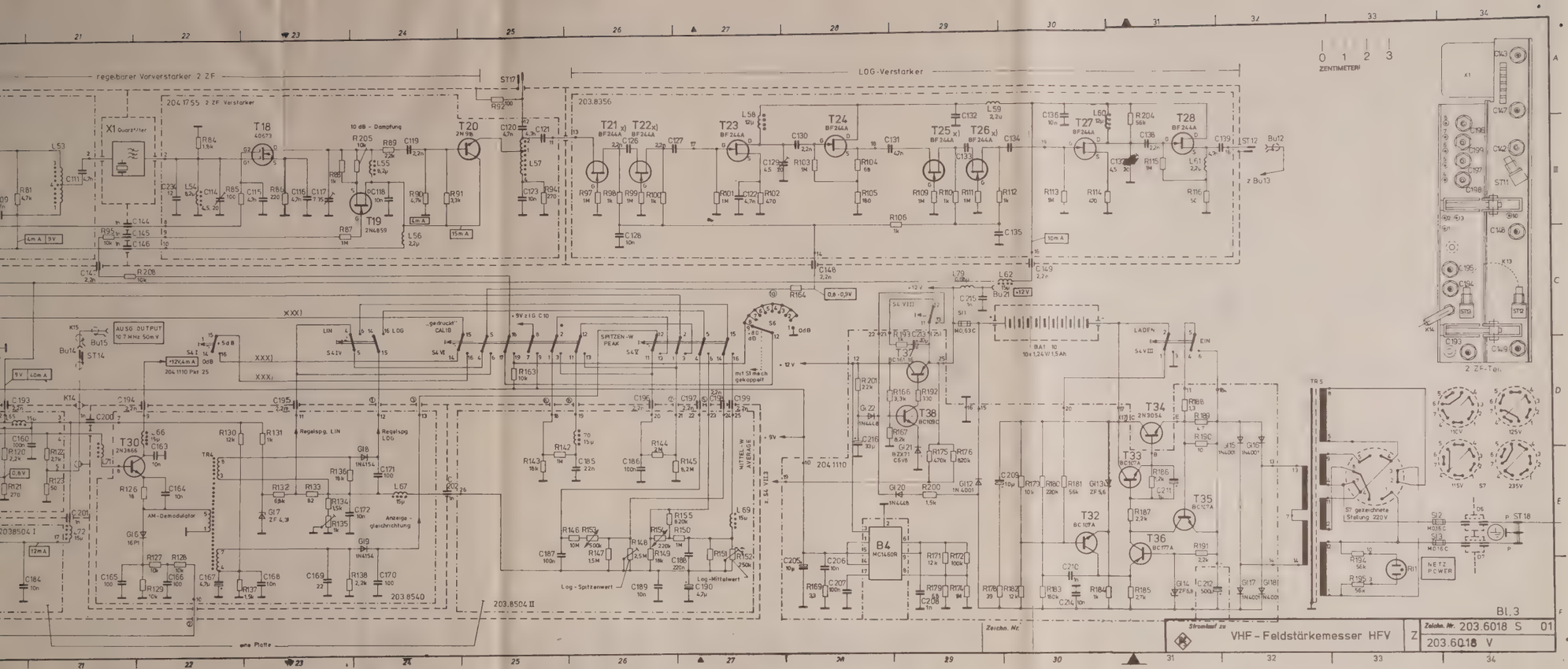
erste Z. ——

Zeichn. Nr. 203.6018 S | 01

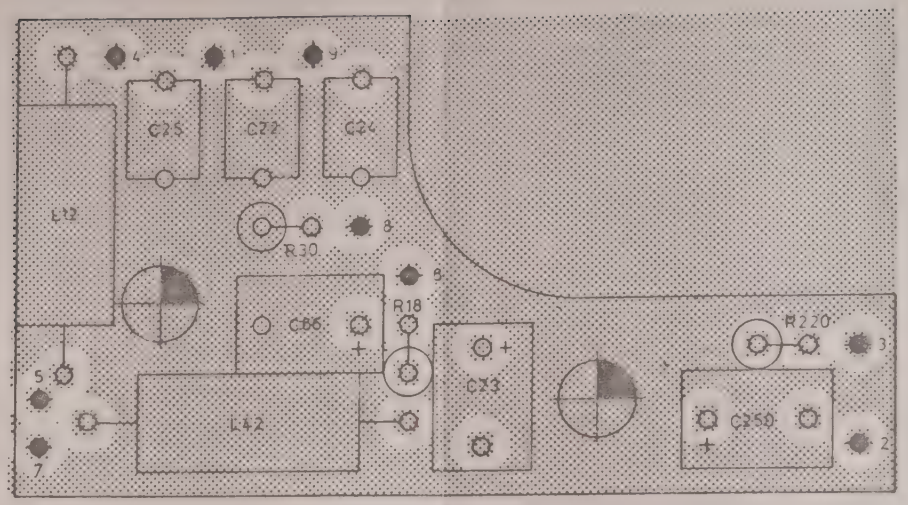
ROHDE & SCHWARZ MÜNCHEN

Stelle	gez. Datum	bearb. Datum	geprüft Datum	Ordn.-Nr. (nur für K-Ordner)
1EMU	10.7.73 Hg	10.7.73 SL		

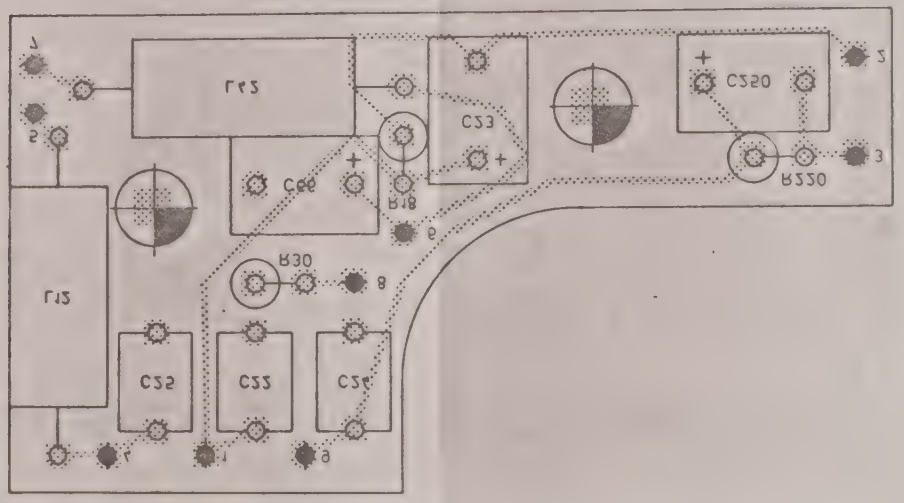

ROHDE & SCHWARZ · MÜNCHEN
Stromlauf BL.2 für VAR 02.03 u.04.07 u.08
BL.3 für VAR 05
Y1 Antenne s 203 7108 S
S1 s 204 0571 S
EING INPUT 50Ω
Y2 HF-Umschaltung s 203 6660 S
Y3 HF-Umschaltung s 203 6660 S
Y11 1 ZF-Verstärker 2 04 2416 (hierzu 204 2416 SA)
Y12 Mischer s 204 2451 S
Y5 Mischer s 203 7950 S
Y9 Squelch Platine s 204.1632 S
Y10 AFC-Platine 204.2316 S
Flankensteilheit
Frequenz
Arb Punkt
Pulsgenerator 204.1726
2036275
2. Oszillator 2038156
10-stelliger 2036318
Meßpunkt f. Diodenstrom
SQUELCH
CHECK
AFC
S41
Anzeige Verstärker
Volt-Skala
Nullabgleich
NF-Verstärker
ZF-Verstärker
Endverstärker
FM-Demodulator
Spannungen gemessen gegen Masse Ri ~10 MΩ z.B. UGWD
Ströme gemessen mit Multavi (ohne Signal)
S4 gezeichnete Stellung ungedrückt
AFC SQUELCH AM LOG MITTEL-W AVERAGE CALIB. BATT
FM LIN SPITZEN-W. PEAK
RECORD
R157, R163, S4 auf Drucktastenplatte 204.1684
x) nach R&S - Vorschrift ausgesucht
xxx) Leitung ohne Funktion
Rückansicht
Drufsicht


regelbarer Vorverstärker 2 ZF
LOG-Verstärker
204.1755 2 ZF Verstärker
203.8356
T18
T19
T20
T21 x)
T22 x)
T23
T24
T25 x)
T26 x)
T27
T28
10 dB - Dämpfung
ZENTIMETER
T30
T32
T33
T34
T35
T36
T37
T38
B4
MC1460R
AM-Demodulator
Regelspg. LIN
Regelspg. LOG
Anzeige - gleichrichtung
Log - Spitzenwert
Log - Mittelwert
203.8504 I
203.8504 II
203.8540
204.1110
BAT 10
10x 1,24 V/1,5 Ah
2 ZF-Teil
S7 gezeichnete Stellung 220 V
NETZ POWER
VHF - Feldstärkemesser HFV
Zeichn. Nr. 203.6018 S 01
203.6018 V
Bl. 3

Ansicht und Leitungsführung Leiterseite
View of printed side with tracks



Ansicht und Leitungsführung Leiterseite
View of printed side with tracks



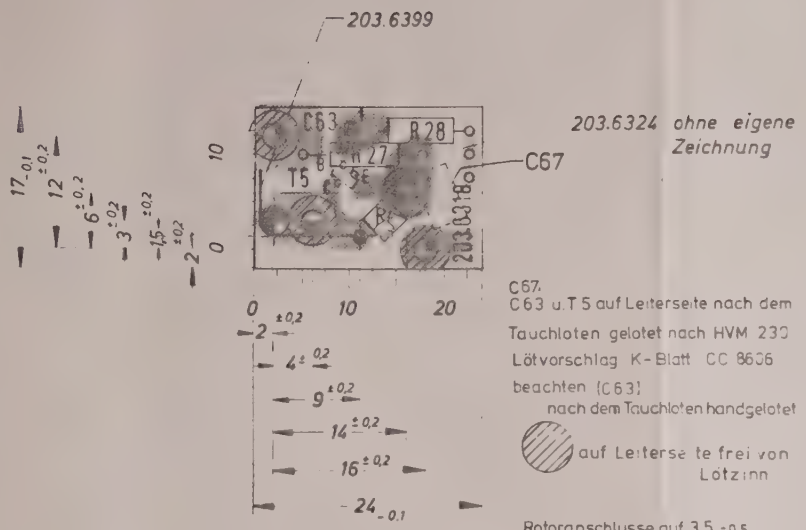
	Datum	Name	Halbzeug Werkstoff	Maßstab 4:1
Δ 17915	2.8.73	Wm		Benennung Platte
				Zeichnung besteht aus 2 Blatt
ROHDE & SCHWARZ				Zeichn. Nr 2036276

Darstellung Bauteilseite
Leitungsführung Leiterseite

bearbeitet nach HVN 170(2)

hierzu 203.6324 DV1 Leiterseite
203.6324 DV4 Bauteilseite(A

tauchgelötet nach HVN 230



203.6324 ohne eigene Zeichnung

C67:
C63 u. T5 auf Leiterseite nach dem Tauchloten gelotet nach HVN 230
Lötvorschlag K-Blatt CC 8606
beachten (C63)
nach dem Tauchloten handgelotet
auf Leiterseite frei von Lötzinn

Rotoranschlüsse auf 3,5 -0,5 abgelangt

Raster 2,5; Toleranz beliebiger Teilungen zueinander ±0,05

- ⌀ 0,85 +0,1
- ⌀ 1,3 +0,1
- ⌀ 2,2 +0,2
- ⌀ 2,6 +0,2
- ⌀ 3 +0,2

VL 082.5253 auf Bauteilseite
Schlitzrichtung der Lötfahne

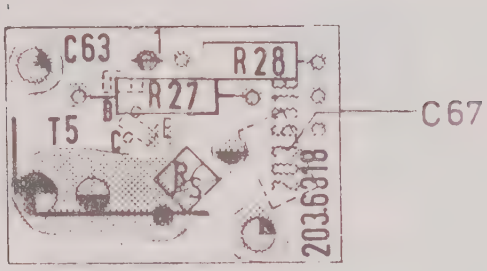
Zeichnung besteht aus 2 Blatt

Blatt Nr. 1

ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff: WS 001.6025	Unbetolerierte Maße	Zeichn. Nr.: 203.6318
1CDD Datum Name	Datum Name	M: 2:1	203 6018 V / 203 6124
gezeichnet 31.8.70 Br	E 20000 0476 Li C 1.1916 1073 SL D 19001 07 73 Ne	Platte	Z

Diese Zeichnung ist unser Eigentum. Vervielfältigung, Weitergabe an Dritte, Mitteilung des Inhalts und Schadenersatzpflicht

Darstellung Bauteilseite
Leitungsführung Bauteilseite



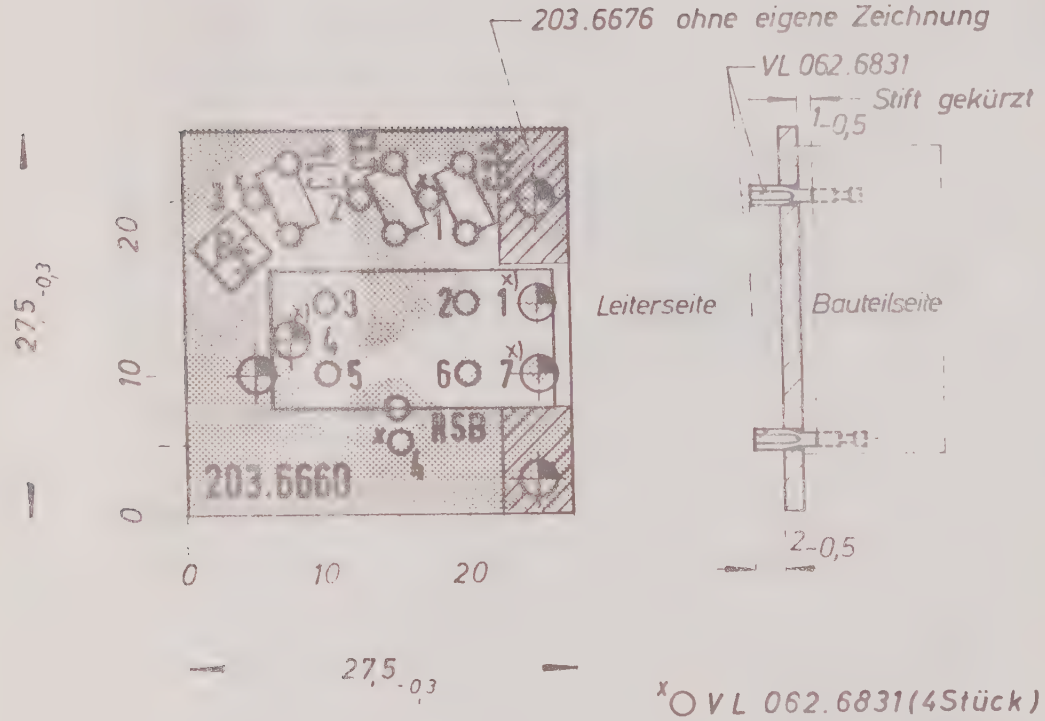
Blatt Nr. 2

ROHDE &				203.6318	
1CDD				203.6018 V	203.6124
31.8 70 Br	B 17133 10.7.72		2:1		
	D 19001 07.74 Ne				
	E 20000 04.76 Li		Platte		

Darstellung Bauteilseite
Leitungsführung Leiterseite

bearbeitet nach HVN 150
hierzu 203.6676 DV1 Leiterseite
203.6676 DV3 Beschriftung

tauchgelötet nach HVN 230



X○ VL 062.6831 (4 Stück) von Leiterseite bestückt.

X○ ○ ⌀1,3+0,1

vor dem Tauchlöten abgedeckt

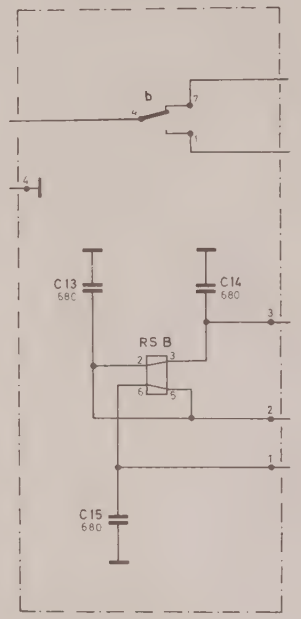
◔ ⌀2,6+0,2 X) nach dem Durchplattieren gebohrt

max Bauhohe auf der Bauteilseite 5,0 mm ausgenommen RSB

Raster 2,5; Toleranz beliebiger Teilungen zueinander ± 0,2

ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff: WS 001.6031	Untolerierte Maße	Zeichn Nr: 203.6660	
		Maßstab: 2:1	203.6018 V	203.6818
1CDD Datum Name	Änd. Nr. Datum Name			
gezeichnet 17.11.70 Grb	A 17133 10.7.72		HF-Umschalter	Z
Geprüft	B 17916 31.7.73 SI			

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.



Die Eintragung der elektrischen Werte von Bauelementen ist unverbindlich. Genaue Werte siehe Schaltteilliste

Vervielfält.-Pause Nr.

Arbeitspaus e Nr.

1CDE	Datum	Name	Änd. zust.	Änd.-Mittlg. Nr.	Datum	Name
gezeichn.	3.9.70	Schim	A	15819	2.4.71	Cu
bearbeitet		Cu				
geprüft						
normgepr.						

Zeichn. Nr. 203.6660 S | best. aus 1 Blatt

203.6018 V | 203.6818 | Blatt Nr.

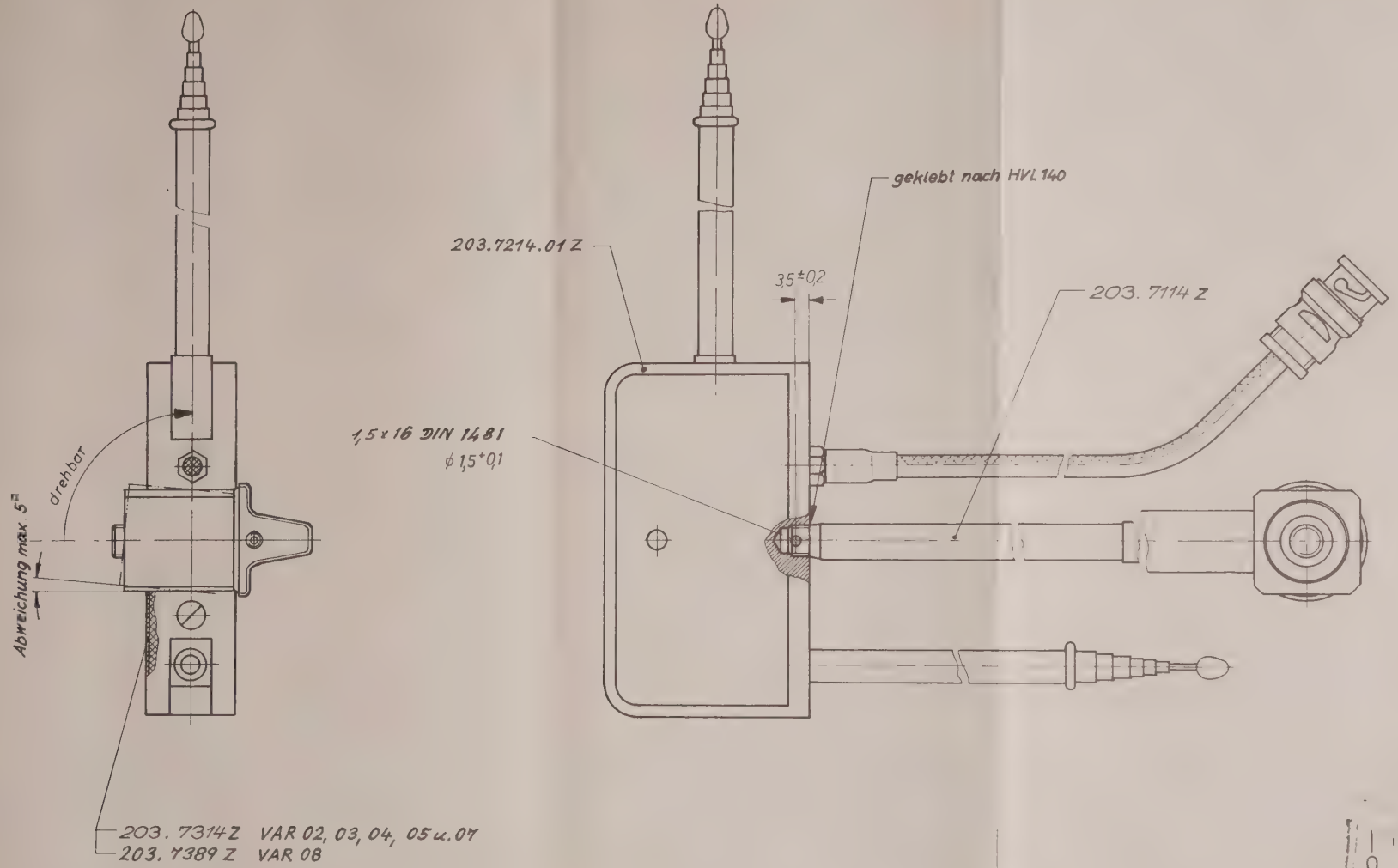
Stromlauf zu

HF-Umschaltung

Z

4313:

ROHDE & SCHWARZ MÜNCHEN



0 1 2 3
ZENTIMETER

ROHDE & SCHWARZ
MÜNCHEN

1CDL	Datum	Name
gezeichnet	2.2.70	Fn
bearbeitet		Hz
geprüft		
normgepr.		

Halbzeug, Werkstoff: —

Änd. zust.	Änd. Mittlg. Nr	Datum	Name
A	—	9.7.70	GSS
B	15819	3.71	Hz
C	17316	7.73	[illegible]
D	19347	11.74	Mi

Untolerierte Maße: —

Maßstab: 1:1

Zeichn. Nr.: 203.7108 01

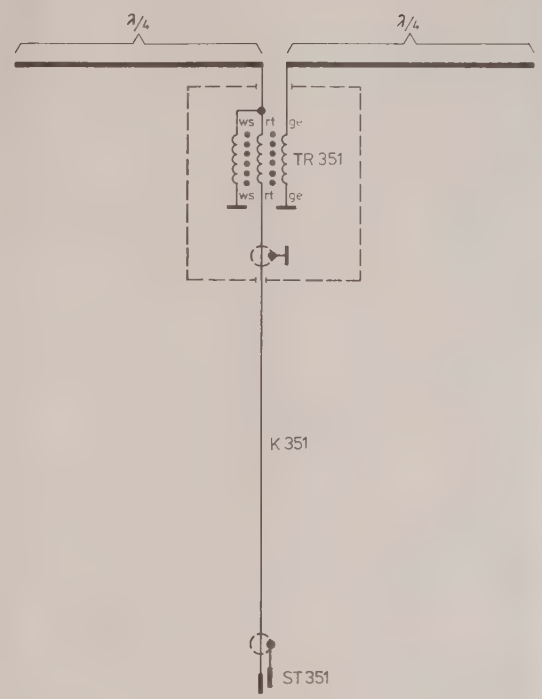
203 6018 V | 203 6018

Ersatz f. Zeichn.

Antenne

Z

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.



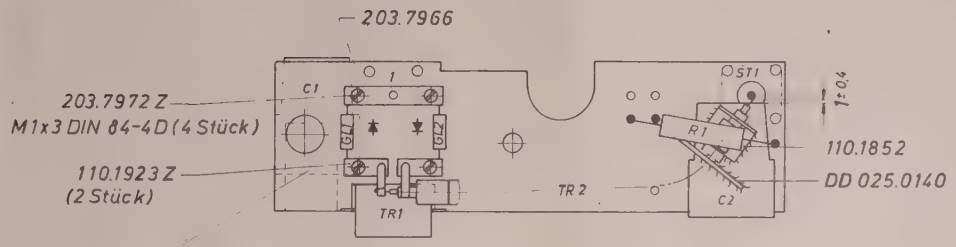
Iso-Proj Meth E

Änd zust	Änd.-Mittlg Nr	Datum	Name	Halbzeug, Werkstoff	Maßstab	Untol. Maße
B	17557	31.10.72	Ka			
					Benennung: Antenne	Z
					Zeichnung besteht aus 1 Blatt	Blatt-Nr.
				registr. in Verz.: 203.6018 V	erste Z.: 203.6018	Zeichn. Nr.: 203.7108 S

ROHDE & SCHWARZ MÜNCHEN

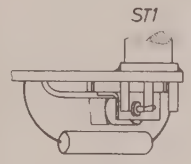
Stelle	gez. Datum	bearb. Datum	geprüft Datum	Ordn.-Nr. (nur für K-Ordner)
1EMU		31.10.72 Ka		

Bei TR1 Drahtenden so kurz wie möglich angelötet



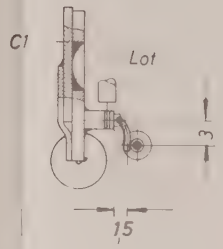
C1 und 110.1869 auf Leiterseite

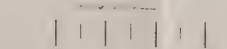
TR1 mit HHL 501 festgelegt



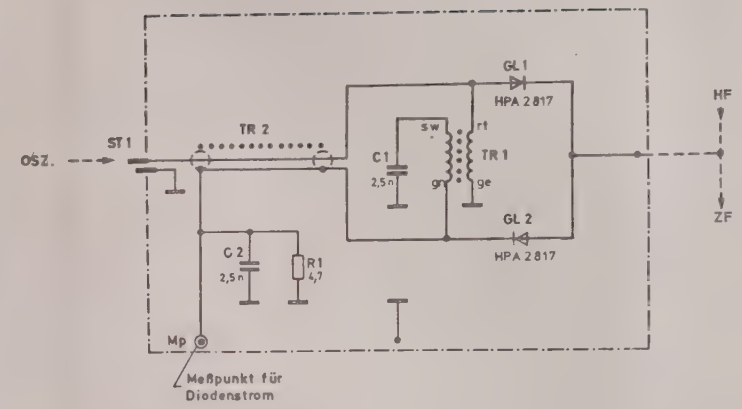
Anschlußschema TR1
(vereinfacht)

gelötet nach HVM 230;
niederschmelzendes Lot und Speziallötkolben mit niederer Temperatur (max. 155 °C) verwenden.
Beläge von C1 und C2 nicht mit Lötkolben verletzen.





ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff		Untolerierte Maße ± 0,3	Zeichn. Nr. 203.7950	
1CDD	Datum	Name	Änd. zust.	Änd. Mittlg. M. Datum Name	Maßstab 2:1	203.6018 V	203.7737
gezeichnet	5.12.70	Stg				Ersatz f. Ze.-Nr.	
bearbeitet					Mischer		Z
geprüft							
normgepr.							



Die Eintragung der elektrischen Werte von Bauelementen ist unverbindlich. Genaue Werte siehe Schaltteilliste

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ISO Projektion, Methode E

Vervielfält. Pause Nr.

Arbeitspause Nr.

ROHDE & SCHWARZ
MÜNCHEN

Halbzeug, Werkstoff

Unbetonierte Maße

Maßstab

Zeichn. Nr. 203.7950 S

203.6018 V | 203.7737

Ersatz f. Zeichn.

1 CDE	Datum	Name	Änd. Zust.	Änd. Mitteilung Nr.	Datum	Name
gezeichnet	17.11.70	Ci	A	17916	30.7.73	Sl
bearbeitet		Cu				
geprüft						
normgepr.						

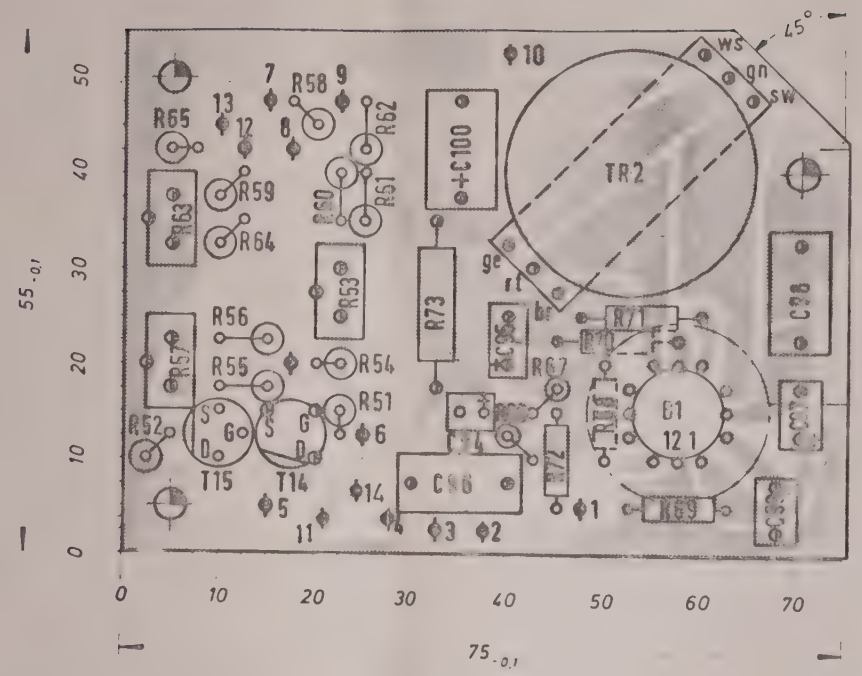
Stromlauf zu

Mische[illegible]

Z

4396.0166.200 H 47

Darstellung Bauteilseite
Leitungsführung Leiterseite



⌀ 0,85 +0,1 Raster 2,5 (1,25); Toleranz beliebiger Teilungen zueinander ± 0,2

⌀ 1,3 +0,1

⌀ 3,2 +0,2

vergoldet
hierzu 203 8004 DV1 Leiterseite (B
203 8004 DV2 Lötstop (B
203 8004 DV 3 Beschriftung (B

tauchgelötet nach HVN 230

203.8004 ohne eigene Zeichnung

AZ 014.8838

VL 035.3412 (14 Stück)
Schlitzrichtung der Lötfahne

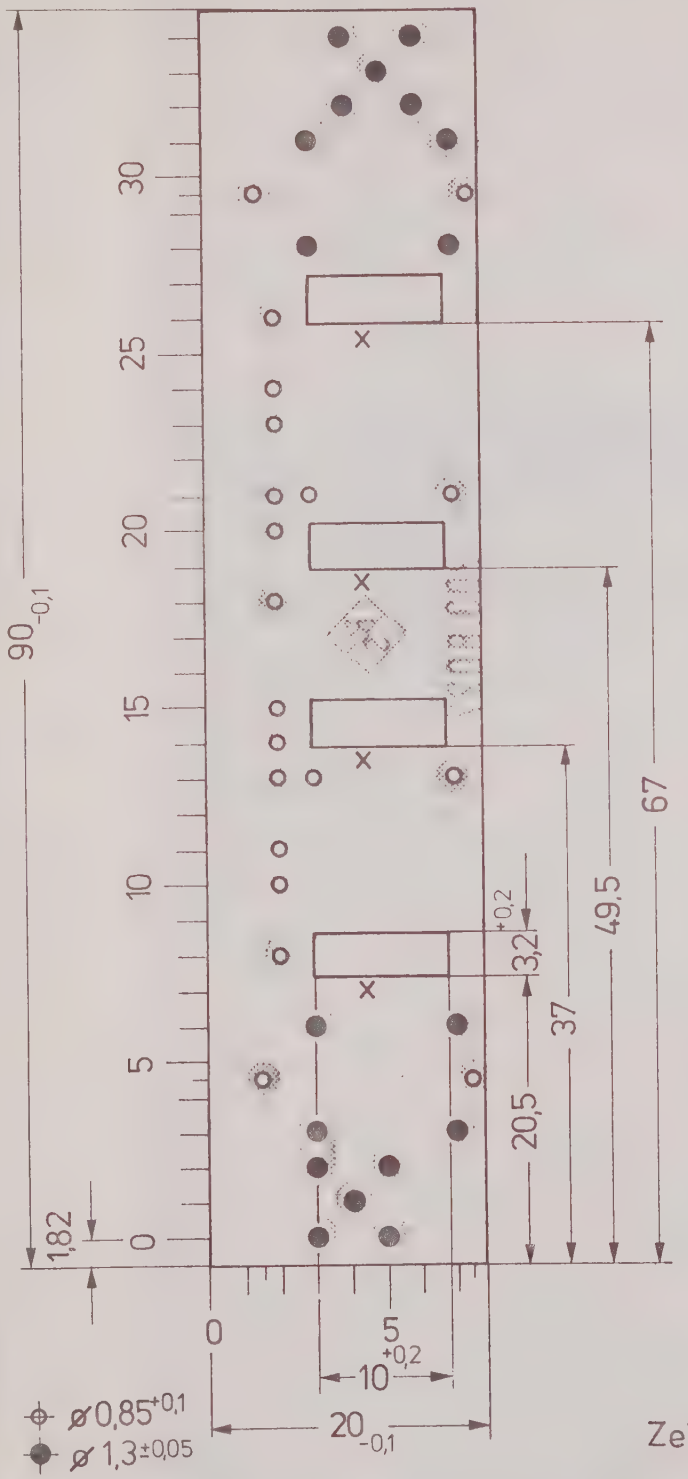
T14 auf FR017.0950
T15 auf AZ 014 8938

ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff WS 001.6031	Unfolierte Maße	Zeichn Nr 203.7995	
		Maßstab 2:1	203 6018 V	203.6018
1 CDD Datum Name	Änd Anl Mitt Nr Datum Name			
gezeichnet 27.11.70 Stg	A 17107 8.5.72 Wm			
geprüft	B 17875 11.5.73 Sl			
genehmigt	C 19001 10.7.74 Ml	Platte		Z

Darstellung Bauteilseite
Leitungsführung Leiterseite

durchplattiert

hierzu 203.8027 DV 1 Leiterseite
203.8027 DV 4 Bauteilseite (A



Raster 2,54; (1,27) Toleranz beliebiger Teilungen zueinander ±0,05

x nach dem Durchplattieren gestanzt

Zeichnung besteht aus 2 Blatt
Blatt Nr. 1

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ
MÜNCHEN

Halbzeug, Werkstoff: 1,2 EP-HGW 2X CU WS 001.6025

Untolerierte Maße: ±0 2

Zeichn. Nr.: 203.8027

Maßstab: 2:1

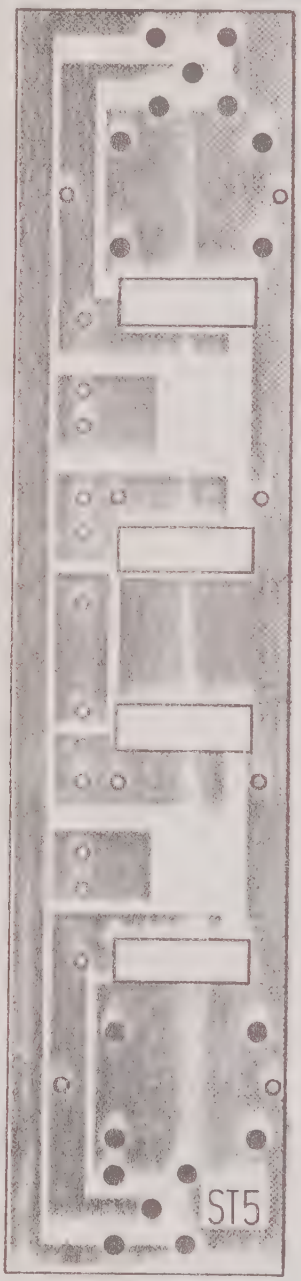
203.6018 V | 203.8010

Ersatz f. Zeichn.

1CDD	Datum	Name	Änd zust	Änd Mitlg. Nr	Datum	Name
gezeichnet	17.12.71	Mlr	A	17133	17.12.71	Mlr
bearbeitet			B	19001	23.1.74	H. W.
geprüft						
normgepr						

Platte

Darstellung Bauteilseite
Leitungsführung Bauteilseite



Blatt Nr. 2

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff		Untolerierte Maße	Zeichn. Nr. 203.8027	
					Maßstab 2:1	203.6018 V	203.8010
1CDD	Datum	Name	Änd. zust.	Änd. Mitteilg. Nr.	Datum	Name	Ersatz f. Zeichn.
gezeichnet	17.12.71	Mlr	A	17133	17.12.71	Mlr	Platte
bearbeitet			L	330	23.1.74	H.W	
geprüft							
normgepr							

...ubelagte Verwertung, Mitteilung an andere strafbar und schadenersatzpflichtig.

100 S

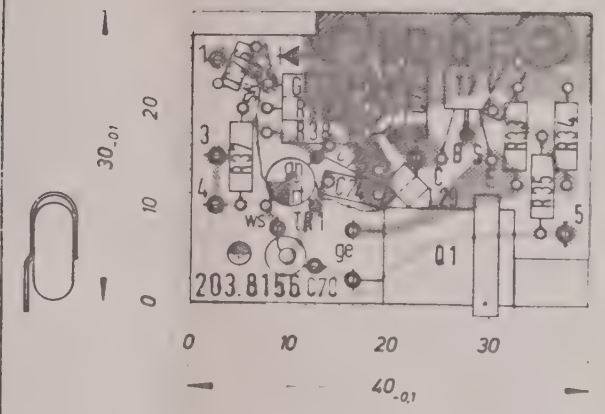
Darstellung Bauteilseite
Leitungsführung Leiterseite

bearbeitet nach HVN 170 (2)
hierzu 203.8162 DV1 Leiterseite B)
203.8162 DV2 Lötstop
203.8162 DV3 Beschriftung

6 ø vor dem Tauchlöten abgedeckt

tauchgelötet nach HVN 230

203.8162 ohne eigene Zeichnung



VL 082.5253 (12 Stück)

Schlitzrichtung der Lötfahne

Alle Bauteile aufliegend

Maximale Lötpunkthöhe 1,8 mm

– 204.1526

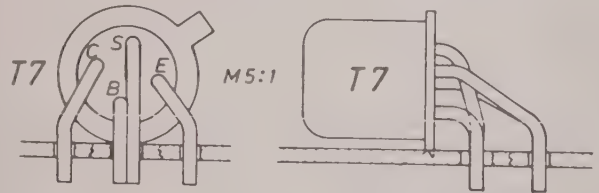
Raster 2,5; (1,25); Toleranz beliebiger Teilungen zueinander ± 0,2

ø 0,85 +0,1
ø 1,3 +0,1
ø 2,6 +0,2
ø 4,8 +0,2

nach dem Durchplattieren gebohrt

Q1, C70, C71 handgelötet

L29 festgelegt mit HHL 501

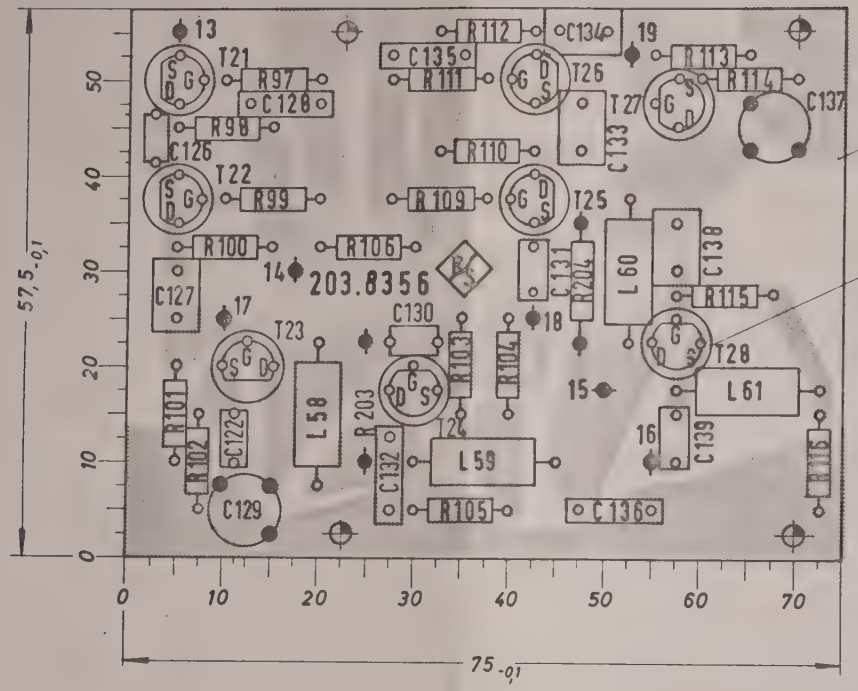


ROHDE & SCHWARZ	WS 001.5970		203.8156
1CDD		2:1,51	203 6018 V / 203.7466
15.9.70 Br	A — 10.12.70 Br B 17133 7.7.72 C 19001 8.74 Mi D 19367 11.74	Platte	Z

Darstellung Bauteilseite
Leitungsführung Leiterseite

bearbeitet nach HVN150
hierzu 203.8362 DV1 Leiterseite (B
203.8362 DV3 Beschriftung (A

tauchgelötet nach HVN 230



203.8362 ohne eigene Zeichnung

AZ 014.8938 (8 Stück)

Alle Bauteile auf der Platte aufliegend

VL 035.3412 (11 Stück)
Schlitzrichtung der Löttahne

⌀0,85 +0,1
⌀1,3 +0,1
⌀1,8 +0,1

Raster 2,5 (1,25); Toleranz beliebiger Teilungen zueinander ± 0,2

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff WS 001-6031				Untolerierte Maße	Zeichn. Nr. 203.8356	
1CDD	Datum	Name	Änd. zust.	Änd. Mitteilg Nr.	Datum	Name	Maßstab 2:1	203.6018 V	203.8233
gezeichnet	13.11.70	Grb	A	17139	27.6.72	Wm		Ersatz f. Zeichn.	
bearbeitet			B	17496	11.9.72	Hi			
geprüft							Platte		Z
normgepr.									

Darstellung Bauteilseite
Leitungsführung Leiterseite

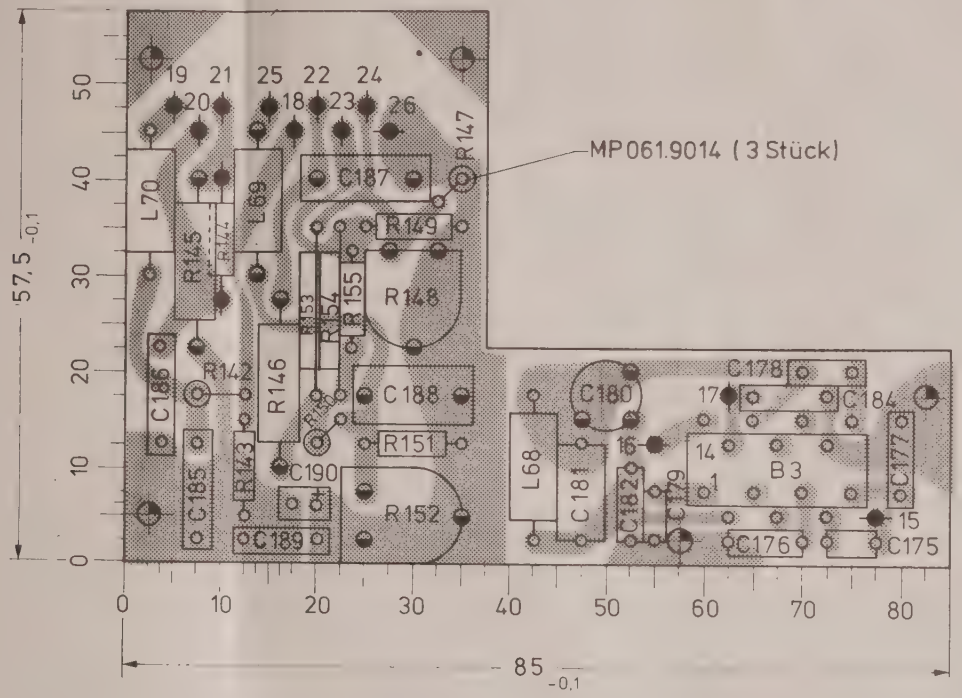
Kaschierung der Bauteilseite besteht nur aus Lötpunkten

durchplattiert

hierzu 203.8510 DV1 Leiterseite (B
203.8510 DV4 Bauteilseite (A

tauchgelötet nach HVN 230

203.8510 ohne eigene Zeichnung



Alle Bauteile auf der Platte aufliegend

VL035.3412 (14 Stück)

Schlitzrichtung der Lötfahne

R144 nach dem Tauchlöten handgelötet

Raster 2,5; (1,25); Toleranz beliebiger Teilungen zueinander ± 0,05

0 1 2 3
ZENTIMETER

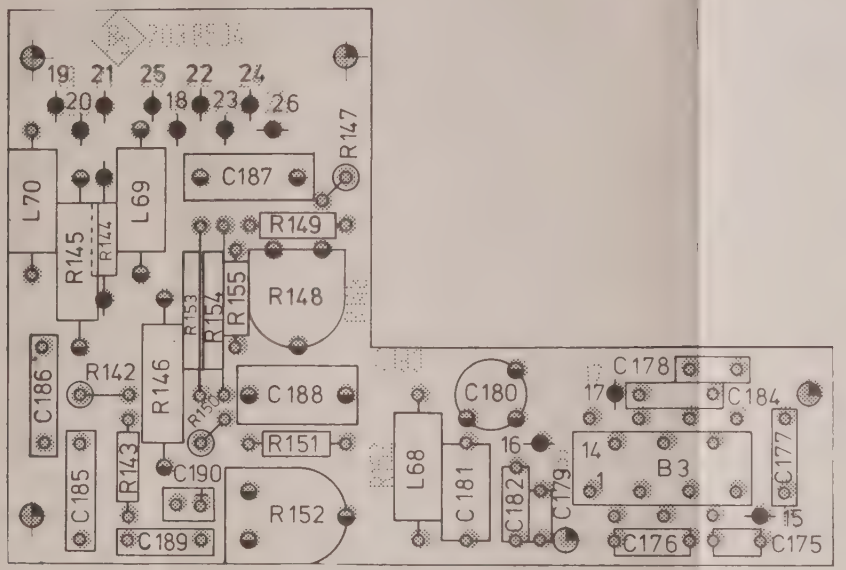
⌀ 0,85 +0,1
⌀ 1,3 ±0,05
⌀ 1,8 +0,1

Zeichnung besteht aus 2 Blatt
Bl. 1

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff: 1,6 EP-HGW 2XCU WS002 3559				Untolerierte Maße	Zeichn. Nr. 203.8504	
1EMU	Datum	Name	Änd. zust.	Änd Mittlg. Nr	Datum	Name	Maßstab 2:1	203.6018 V	203.8233
gezeichnet	21.6.72	Br	B	17133	21.6.72	Br		Ersatz f. Zeichn.	
bearbeitet			C	20000	04.76	Li			
geprüft								Platte	Z
normgepr.									

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Darstellung Bauteilseite
Leitungsführung Bauteilseite



Bl. 2

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff					Untolerierte Maße	Zeichn. Nr. 203.8504	
1EMU	Datum	Name	Änd zust	Änd Mittlg Nr.		Datum	Name	Maßstab 2:1	203.6018 V	203 8233
gezeichnet	21 6 72	Br	B	17133		21.6.72	Br		Ersatz f Zeichn	
bearbeitet								Platte		Z
geprüft										
normgepr										

Darstellung Bauteilseite
Leitungsführung Leiterseite

bearbeitet nach HVN 150

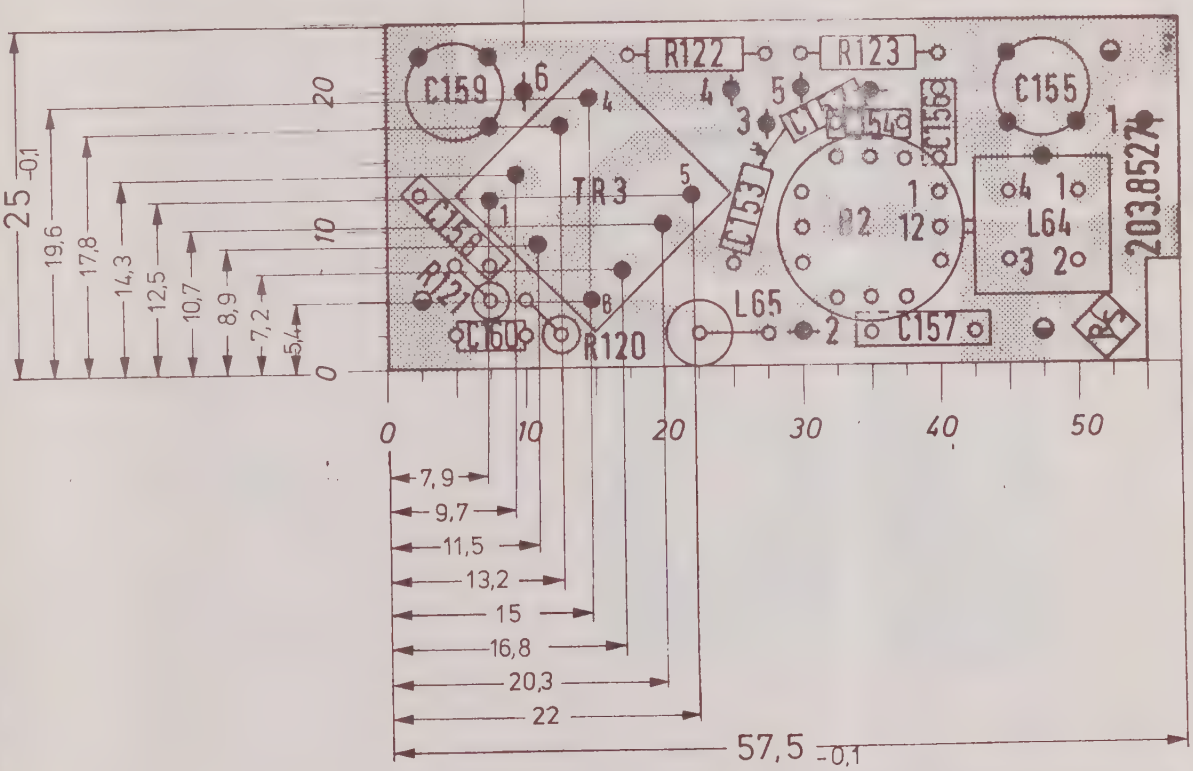
hierzu 203.8533 DV1 Leiterseite (D
203.8533 DV3 Beschriftung

tauchgelötet nach HVN 230

- VL 035.3412 (7Stück)
- Schlitzrichtung der Lötfahne

R120 und R121 auf MP 061.9014

203.8533 ohne eigene Zeichnung



Raster 2,5 ; Toleranz beliebiger Teilungen zueinander ± 0,2
Außer B2 alle Bauteile auf der Platte aufliegend
Bauhöhe von B2 max. 8,5 mm

C 152 handgelötet

- ⌖ ϕ 0,85 +0,1
- ⌖ ϕ 1,3 +0,1
- ⌖ ϕ 1,8 +0,2

Änd. zust.	Änd.-Mittlg. Nr.	Datum	Name
A	17133	6.7.72	Ka
B	17916	07.73	SL
C	19001	07.74	NL
D	20000	04.76	Li

Halbzeug, Werkstoff: WS 001.6031

Maßstab 2:1 | Untol. Maße ± 0,2

Benennung: Platte | Z

Zeichnung besteht aus 1 Blatt | Blatt-Nr.

registr. in Verz.: 203 6018 V | erste Z.: 203.8233 | Zeichn. Nr.: 203.8527

ROHDE & SCHWARZ MÜNCHEN

Stelle	gez. Datum	bearb. Datum	geprüft Datum	Ordn.-Nr. (nur für K-Ordner)
1 CDD	11.11.70	Stg		

Iso-Proj. Meth. E

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

PF 095 0178

Darstellung Bauteilseite
Leitungsführung Leiterseite

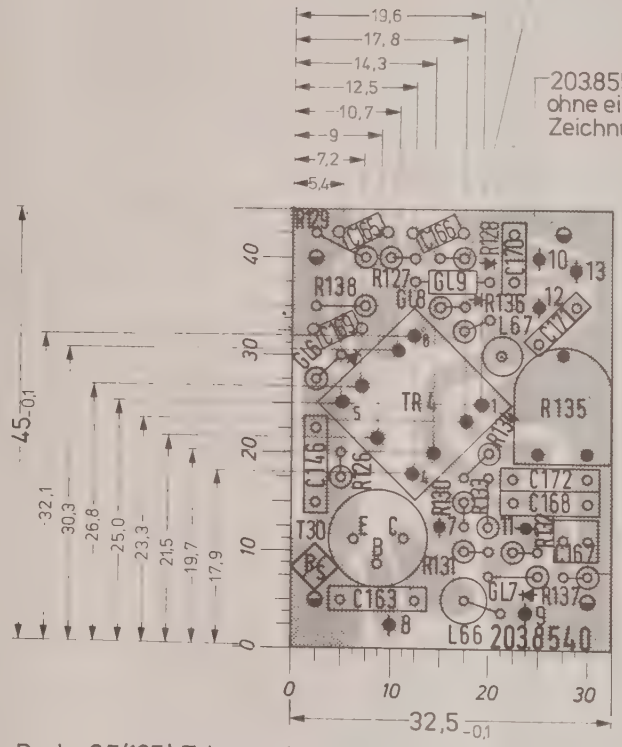
bearbeitet nach HVN 150

hierzu 203.8556 DV 1 Leiterseite (B
203.8556 DV 3 Beschriftung

tauchgelötet nach HVN 230

MP061.9014
(15 Stück)

203.8556
ohne eigene
Zeichnung



Raster 2,5 (1,25); Toleranz beliebiger Teilungen zueinander ±0,2

Alle Bauteile auf der Platte aufliegend

- VL 035.3435 (7 Stück)
- Schlitzrichtung der Lötfahne

φ0,85 +0,1
φ1,3 +0,1
φ1,8 +0,2

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Iso-Proj. Math. E

Änd zust	Änd.-Mitteig Nr	Datum	Name
A	17133	10 7 72	Ka
B	17557	31.10 72	Ka
C	17916	07 73	SL

Halbzeug, Werkstoff: WS001.6031

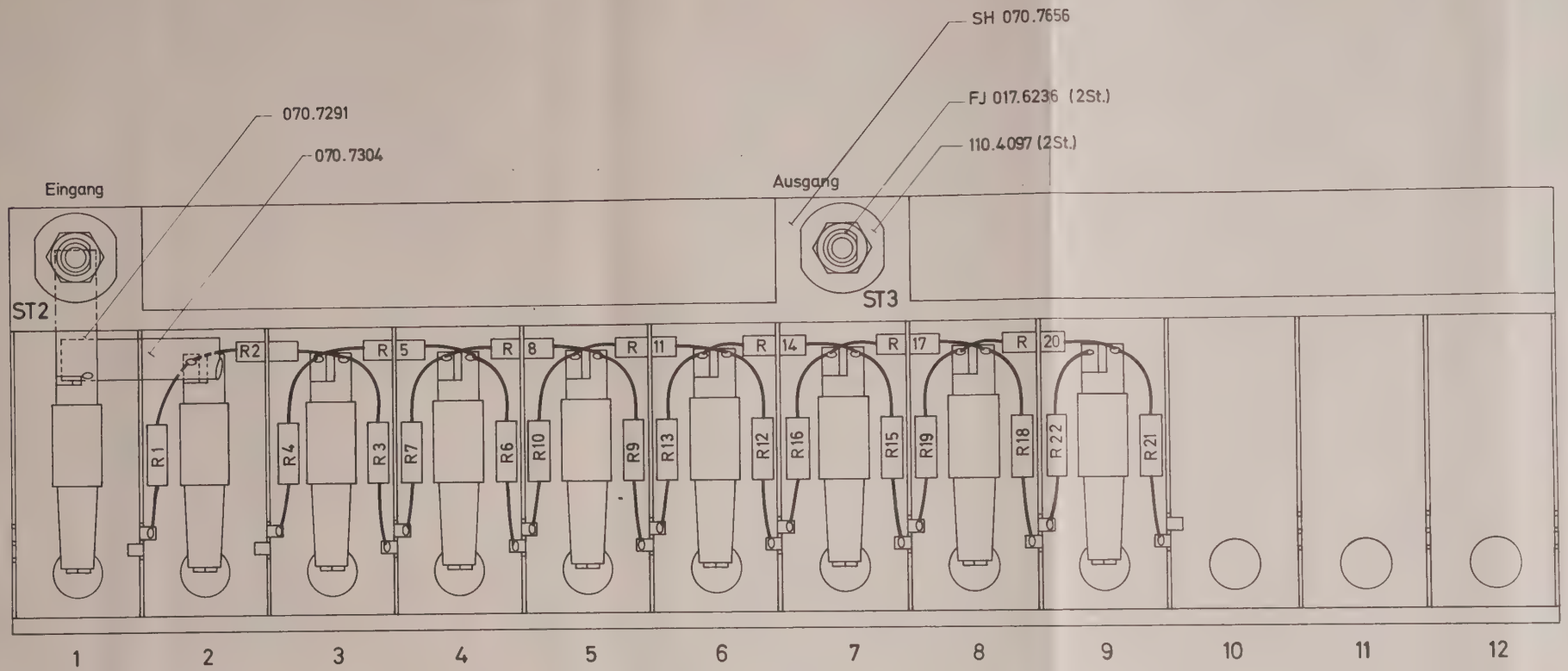
Maßstab 2 : 1 | Untol. Maße

Benennung: Platte | Z

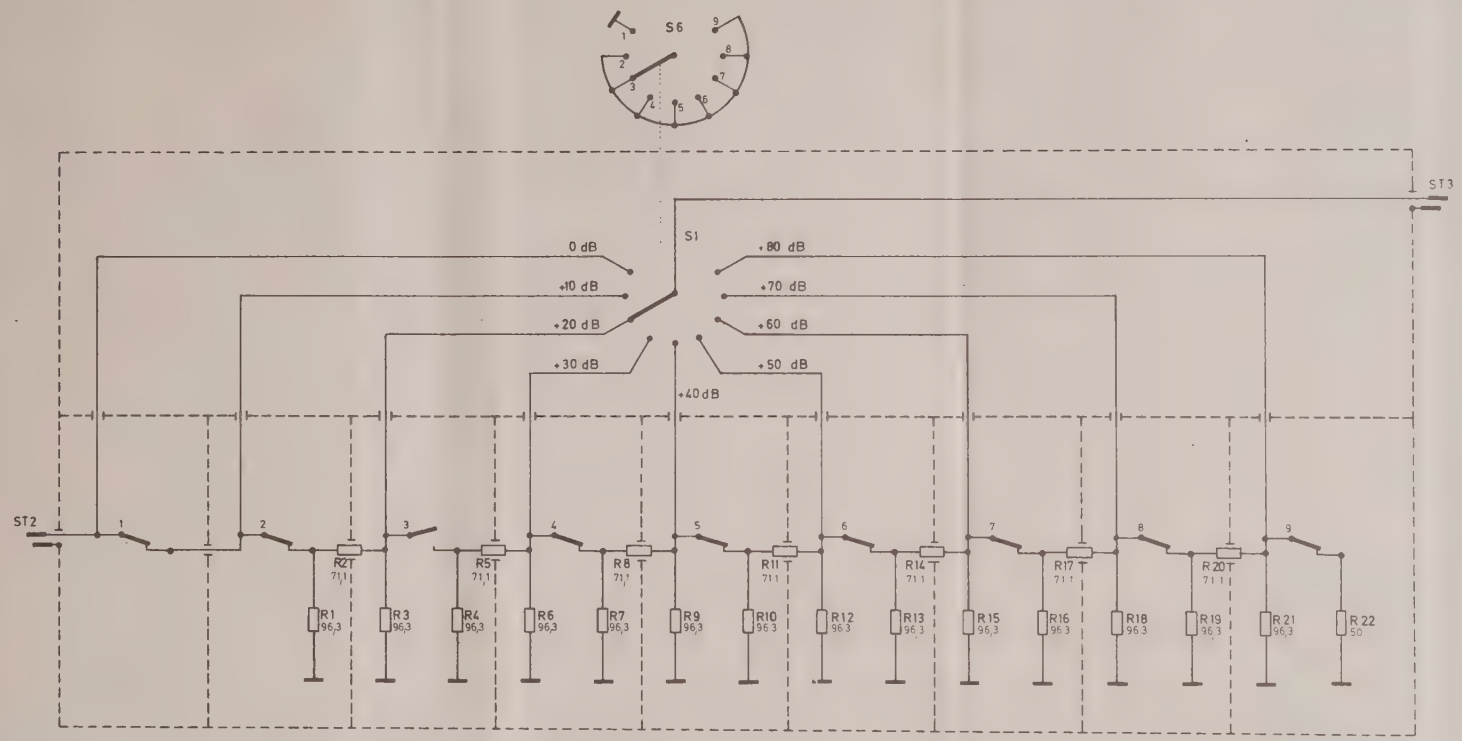
Zeichnung besteht aus 1 Blatt | Blatt-Nr.

registr. in Verz.: 203.6018 V | erste Z.: 203.8233 | Zeichn. Nr.: 203.8540

ROHDE & SCHWARZ MÜNCHEN | Stelle 1 CDD | gez. Datum 9.11.70 | bearb. Datum Stg | geprüft Datum | Ordn.-Nr (nur für K-Ordner)



ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff				Untolerierte Maße
1 CDE	Datum	Name	Änd. zust.	Änd Mittlg Nr	Datum	Name	Maßstab 2:1
gezeichnet	18.12.70	Pa					Zeichn. Nr. 204.0571
bearbeitet		Cu					203.6018 V / 203.6018
geprüft							Ersatz f. Zeichn.
normgepr.							Teilerschalter Z



Die Eintragung der elektrischen Werte von Bauelementen ist unverbindlich Genaue Werte siehe Schaltteilliste

0 1 2 3
ZENTIMETER

Stromlauf zu

Teilerschalter

Z

Zeichn. Nr. 204.0571 S

203.6018 V | 203.6018

ROHDE & SCHWARZ · MÜNCHEN

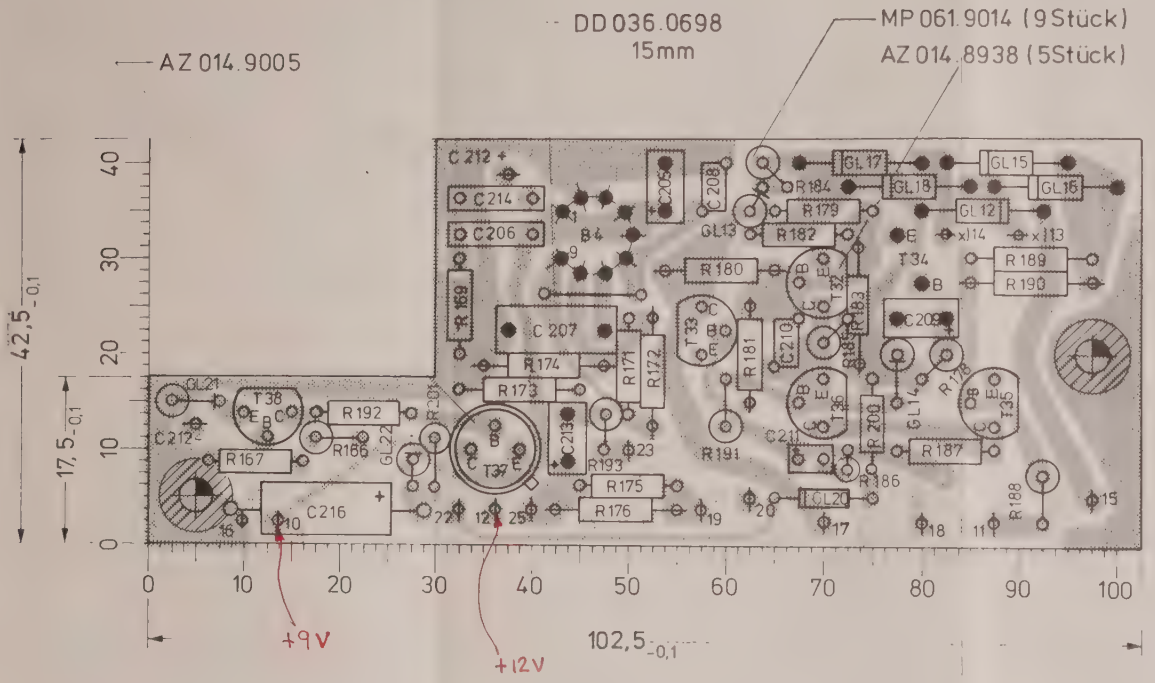
Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Darstellung Bauteilseite
Leitungsführung Leiterseite

durchplattiert

hierzu 204.1126 DV 1 Leiterseite (A
204.1126 DV 3 Beschriftung (A
204.1126 DV 4 Bauteilseite (A

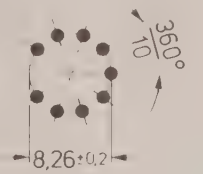
tauchgelötet nach HVN 230



Raster 1,25; Toleranz beliebiger Teilungen zueinander ± 0,05

8 ⌀ vor dem Tauchlöten abgedeckt

204.1126 ohne eigene Zeichnung



Bohrungen von B 4 und T 34 vor dem Tauchlöten abgedeckt

Kollektor von T 34 mit DD 036 0017 auf Stift 17 gelegt

Stift 10, 11, 12, 15, 16, 17, 18, 19, 20, 22, 23 und 25 auf Leiterseite

Alle Bauteile auf der Platte auf-liegend

⊖x) VL 082 5260 (2 Stück)
⊖ VL 082 5253 (28 Stück)
⊖ Schlitzrichtung der Lotfahne

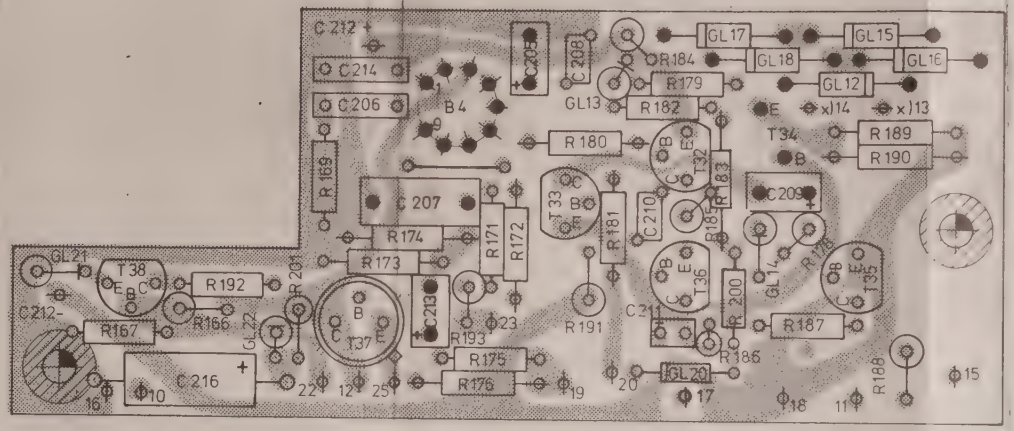
Zeichnung besteht aus 2 Blatt
Blatt Nr 1

⊖⊖⊖x) ⌀ 0,85 +0,1
● ⌀ 1,3 ± 0,05
◔ ⌀ 3,4 +0,2

Änd. zust.	Änd. Mitteilg. Nr.	Datum	Name
A	17557	3.11.72	[illegible]
B	17875	11.5.73	SI
C		30.7.73	SI
D	17944	08.[illegible]	SI
E	17916	08.[illegible]	SI
F	19001	6.74	H W

Halbzeug, Werkstoff: 1,6 EP-HGW 2X CU WS 002 3559
Maßstab: 2:1
Untol. Maße:
Benennung: Platte
Zeichnung besteht aus: Blatt
Blatt Nr:
registr. in Verz.: 203.6618 V
erste Z.: 203.6018
Zeichn. Nr.: 204 1110
ROHDE & SCHWARZ MÜNCHEN
Stelle: 1EMU
gez. Datum: 6.72 Pt
bearb. Datum:
geprüft Datum:
Ordn. Nr. (nur für K-Ordner):

Darstellung Bauteilseite
Leitungführung Bauteilseite



0 1 2, 3
ZENTIMETER

Blatt Nr. 2

	Datum	Name
A 17557	6.11.72	Ka
B 17875	11.5.73	Sl
C	30.7.73	Sl
D 17944	08.73	Sl
E 17916	08.73	Sl
F 19001	06.74	H.W.

Halbzeug, Werkstoff

Maßstab 2:1

Benennung Platte

Zeichn. Nr. 204.1110

registr. in Verz 203 6018 V

erste Z. 203.6018

ROHDE & SCHWARZ

Stelle 1EMU 6972 Pt

bearb. Datum

geprüft Datum

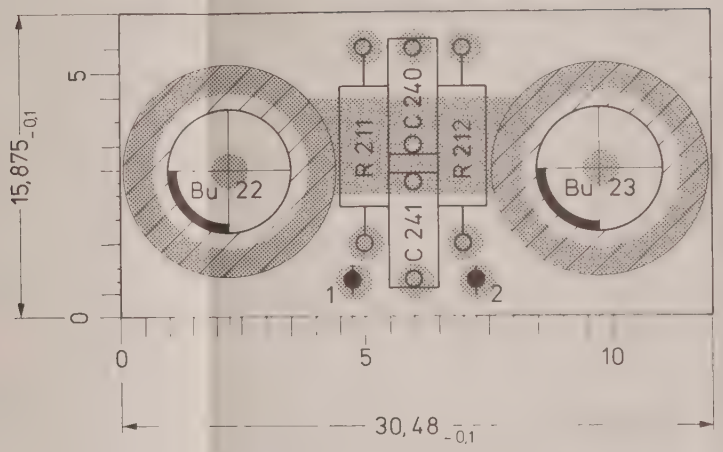
Darstellung Bauteilseite
Leitungsführung Leiterseite

durchplattiert

hierzu 204.1426 DV1 Leiterseite
204.1426 DV4 Bauteilseite

⌀ 11 vor dem Tauchlöten abgedeckt

tauchgelötet nach HVN 230



204.1426 ohne eigene Zeichnung

● VL 082.5253 (2 Stück)
● Schlitzrichtung der Lötfahne

Raster 1,27, (0,635); Toleranz beliebiger Teilungen zueinander ± 0,05

● ⊕ ⌀ 0,85 +0,1

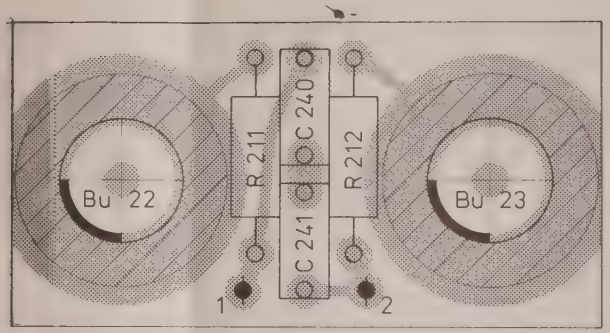
⌀ 6,5 +0,2 nach dem Durchplattieren gebohrt

And. zust.	And.-Mittlg. Nr.	Datum	Name	Halbzeug, Werkstoff	Maßstab 4 : 1	Unfol. Maße
				1,6 EP-HGW 2XCU WS 002 3559	Benennung Platte	
					Zeichnung besteht aus 2 Blatt	Blatt-Nr. 1
				registr. in Verz. 203 6018 V	erste Z. 203 6018	Zeichn. Nr. 204.1410
ROHDE & SCHWARZ MÜNCHEN				Stelle 1EMU	gez. Datum 26.9.72 Pt	bearb. Datum / geprüft Datum / Ordn.-Nr. (nur für K-Ordner)

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

DF 095 0455

Darstellung Bauteilseite
Leitungsführung Bauteilseite



Änd. Anz. / Änd. Mitt.s Nr. / Datum / Name	Halbzeug Werkstoff	Maßstab 4 : 1	Untol. Maße
		Benennung Platte	Z
		Zeichnung besteht aus Blatt	Blatt-Nr. 2
	registr. in Verz 203 6018 V	erste Z. 203 6018	Zeichn. Nr. 204.1410
ROHDE & SCHWARZ MÜNCHEN	Stelle 1EMU / gez Datum 26 9 72 Pt	bearb Datum	geprüft Datum / Ordn.-Nr (nur für K.-Ordner)

Darstellung Bauteilseite

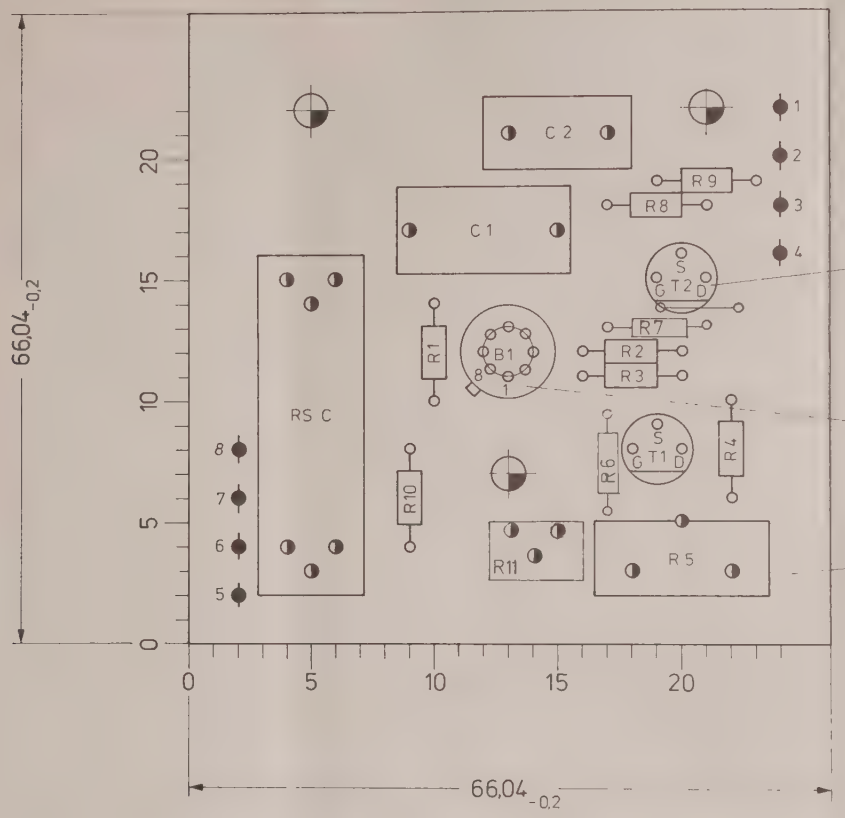
● VL082.5247 (8 Stück)
● Schlitzrichtung der Steckklötöse

durchplattiert,
hierzu 204.1649 DV1 Leiterseite (A Film
204.1649 DV3 Beschriftung (A
204.1649 DV4 Bauteilseite (A Film

204.1649 L (A

tauchgelötet nach HVN 230

max. Bauhöhe auf der Bauteilseite 21mm



AZ014.8934 (2Stück)

BZ082.6908

204.1649 ohne eigene Zeichnung

⊕ ø 0,85 +0,1 Raster x 2,54 ; Toleranz beliebiger Teilungen zueinander ± 0,05

⊕ ø 1,3 +0,1

⊕ ø 3,2 +0,2 nach dem Durchplattieren gebohrt

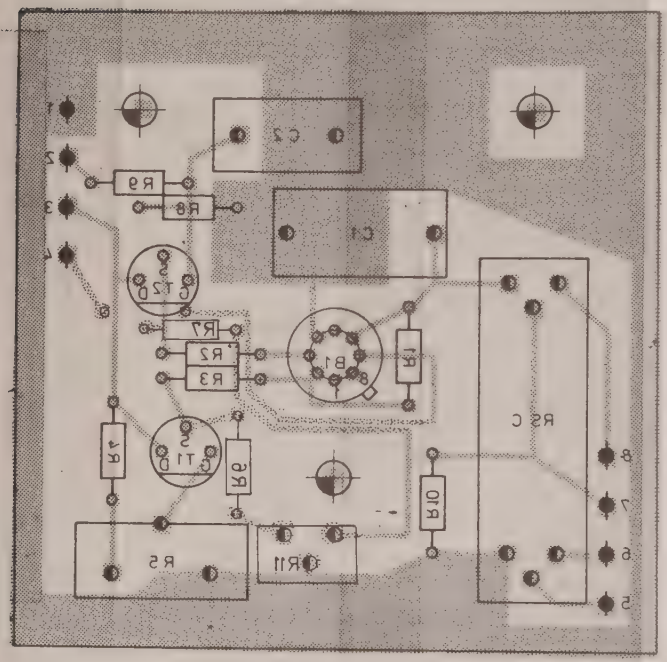
0 1 2 3
ZENTIMETER

And zust	And Mitt Nr	Datum	Name	Halbzeug, Werkstoff	Maßstab	Untol Maße
A	19001	08.74	NL	1,6 EP-HGW 2 x CU WS 002 3559	2:1	
					Benennung: Squelch-Platine	
					Zeichnung besteht aus 2 Blatt	Blatt-Nr. 1
				registr in Verz: 203.6018 V	erste Z.: 204 1603	Zeichn. Nr: 204.1632
ROHDE & SCHWARZ MÜNCHEN				Stelle: 1EMU	gez. Datum: 6 6 73 Wm	bearb. Datum: 06 73 SL; geprüft Datum: ; Ordn.-Nr (nur für K-Ordner):

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig

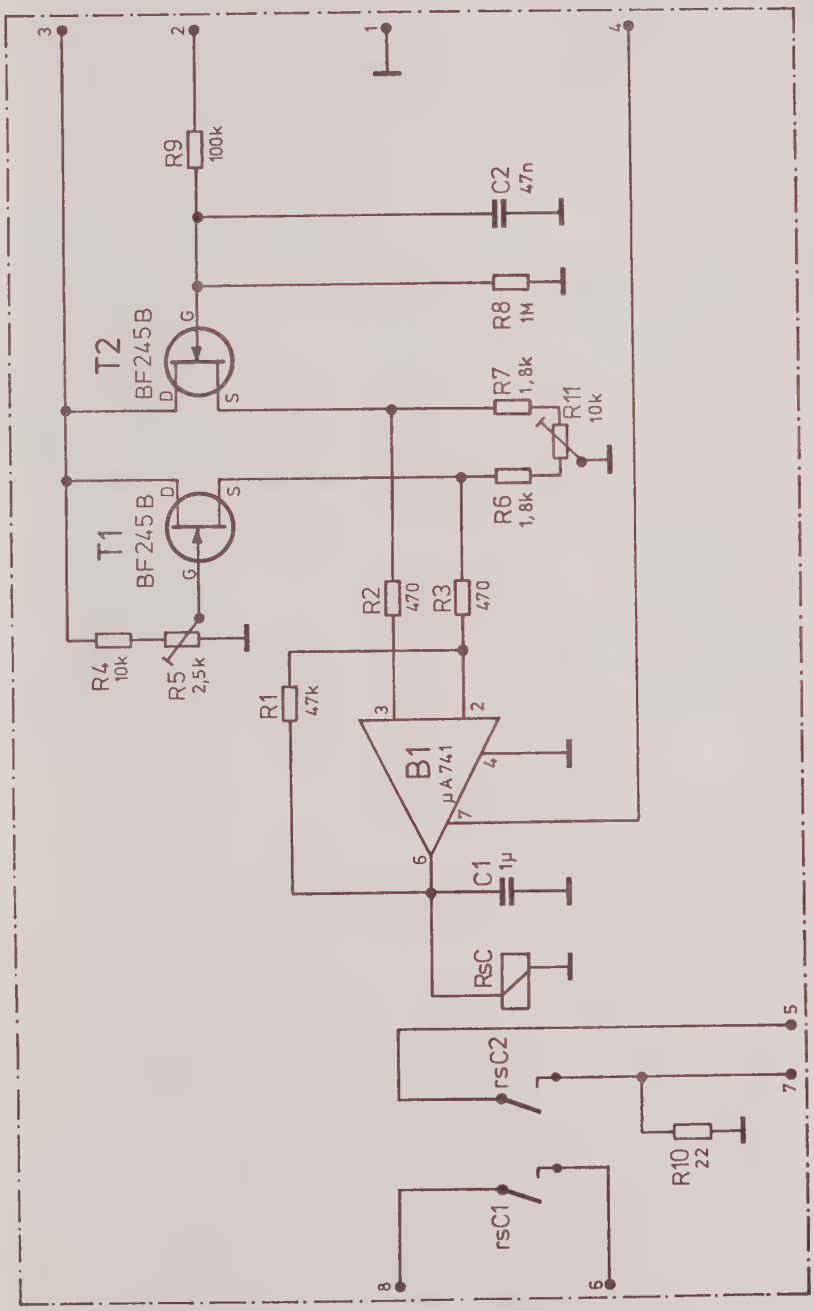
230-Projektion, Maßstab E

Ansicht und Leitungsführung Leiterseite
Bauteilseite besteht nur aus Lotpunkten
View of printed side with tracks
On components side only soldering points



0 1 2 3
ZENTIMETER

A 19001 08.74 NL		2:1 MoBa	
		Benennung: Squelch-Platine	Z
		Zeichnung besteht aus 2 Blatt	Blatt Nr 2
	203 6018 V	erste Z 204 1603	Zeichn Nr 204.1632
MEHNERT & SCHWARZ MÜNCHEN	1EMU 6.6.73 Wm	06.73 SL	



Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

1EMU	Datum	Name	Änd. zust.	Änd.-Mittlg. Nr	Datum	Name
gezeichn	6.6.73	Schim	A	19001	07.74	NL
bearbeitet	06.73	SL				
geprüft						
normgepr.						

Zeichn. Nr. 204.1632 S

203.6018V | 204.1603

best. aus 1 Blatt

Blatt Nr

Benennung

Squelch-Platine

Vervielfältigung ... M

Arbeitspause Nr.

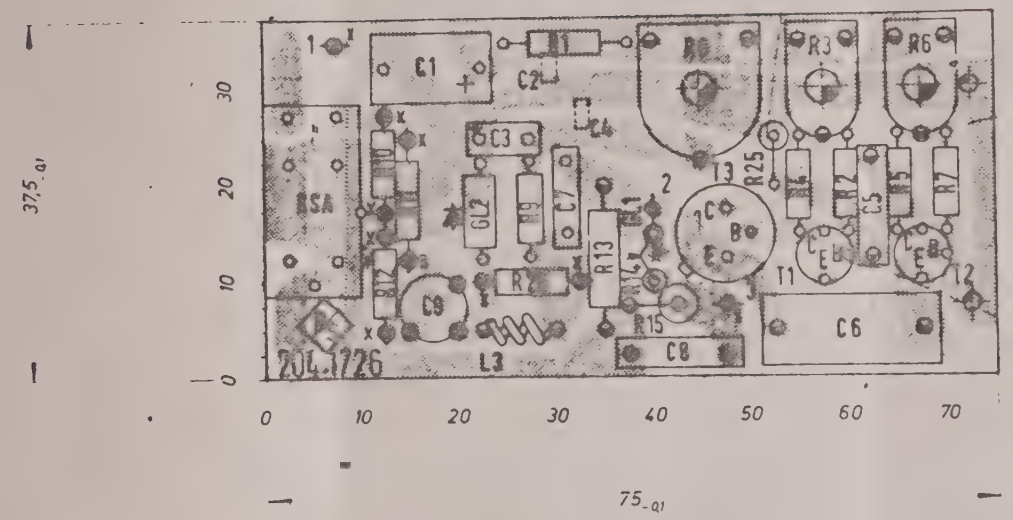
Darstellung Bauteilseite
Leitungsführung Leiterseite

durchplattiert beidseitig vergoldet

hierzu 204.1732 DV1 Leiterseite
204.1732 DV3 Beschriftung
204.1732 DV4 Bauteilseite
(nur als Film vorhanden, abgeleitet aus 203.7720 DV1 DV3 DV4

tauchgelötet nach HVN 230

AZ 014 9011



Alle Bauteile kurz einloten!

204.1732 ohne eigene Zeichnung

x ● VL 082 5253 (10 Stück)
● VL 082 5260 (1 Stück) (Stift Nr 2)
● Schlitzrichtung der Lotfahne

C5 auf 2,5 $^{-0,2}$ mm Abstand setzen

C2, C4 auf Leiterseite
Lotvorschlag K-Blatt CC8505 beachten!

Raster 2,5; Toleranz beliebiger Teilungen zueinander ± 0,05
(1,25)

● x ● ○ ⌀ 0,85 $^{+0,1}$

● ⌀ 1,3 $^{+0,1}$

◐ ⌀ 1,6 $^{+0,2}$

◔ ⌀ 3,2 $^{+0,2}$ nach dem Durchplattieren gebohrt

Zeichnung besteht aus 2 Blatt

Blatt Nr 1

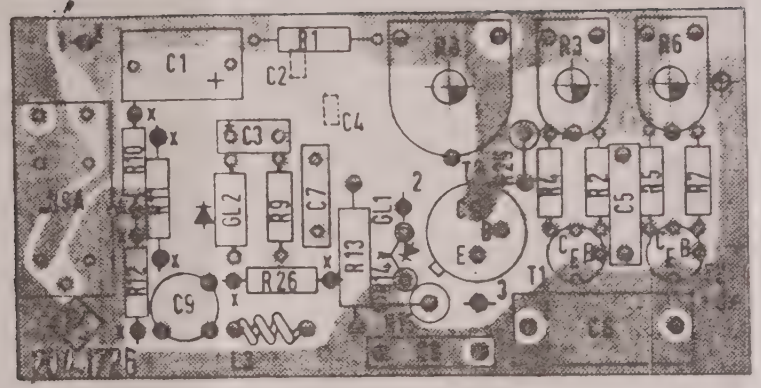
ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff: 1.6 EP-HGW 2x CU WS 002 3559	Unbetonierte Maße	Zeichn Nr: 204.1726
1EMU Datum Name	Änd Zust / Änd Mitteilg Nr / Datum / Name	Maßstab: 2:1	203.6018 V / 204.1710
gezeichnet 14.6.73 Schim			
bearbeitet 06.7.3 Sl		Platte	Z
geprüft			
normgep.			

ISO Prüfstreifen Marbode E

Vorrichtg Nr

Arbeitsplatz Nr

Darstellung Bauteilseite
Leitungsführung Bauteilseite



Blatt Nr 2

ROHDE & SCHWARZ MÜNCHEN	Halbzeug Werkstoff	Unbelastete Maße	Zeichn Nr 204.1726
		Maßstab 2:1	203.6018 V / 204.1710
1EMU Datum Name	Änd. Änd.-Mitteilung Nr. Datum Name		
gezeichnet 14.6.73 Schim		Platte	Z
bearbeitet 06.73 St			
geprüft			
normgeprüft			

Darstellung Bauteilseite

Leitungsführung Leiterseite
Kaschierung der Bauteilseite
besteht nur aus Lötpunkte

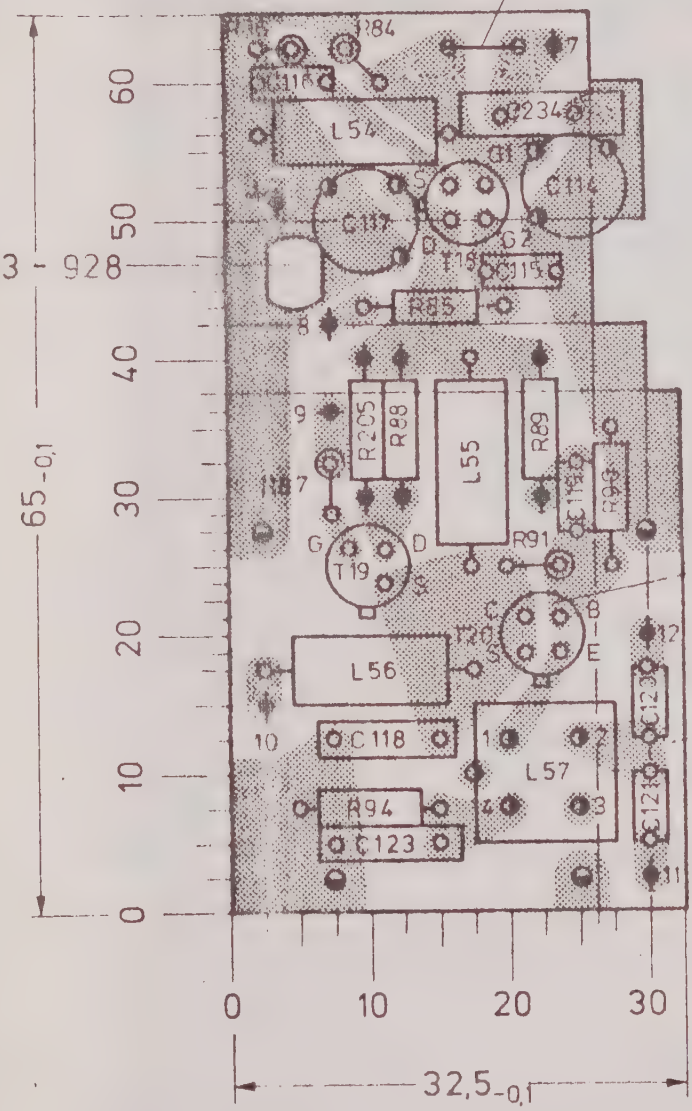
durchplattiert

hierzu 204.1761 DV1 Leiters.
204.1761 DV4 Bauteil

tauchgelötet nach HVN 230

(nur als Film vorhanden, abgeleitet aus 203.8385 DV1, DV4

DD 025.0127 (10mm)



♦ VL 082.5253 (13 Stück)
♦ Schlitzrichtung d. Lötfahne

Für R84, R86, R87 u. R91 max. Einbauhöhe 9mm

Alle Bauteile außer T18, T19 u. T20 auf der Platte aufliegend

AZ 014.8921 (3 Stück)

204.1761 ohne eigene Zeichnung

Raster 2,5(1,25), Toleranz beliebiger Teilungen zueinander ±,005

♦ ⊕ ϕ 0,85 +0,1 ⊕ ϕ 1,8 +0,1

⊕ ϕ 1,3 ±0,05

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff: 1,6 EP HGW 2XCU WS 002.3559		Untolerierte Maße	Zeichn. Nr: 204.1755	
					Maßstab: 2:1	203 6018V	204.1749
1EMU	Datum	Name	Änd zust	Änd Mitlfg Nr	Datum	Name	Ersatz f Zeichn
gezeichnet	14.6.73	Schim					
bearbeitet	06.73	SL					
geprüft							
normgepr							

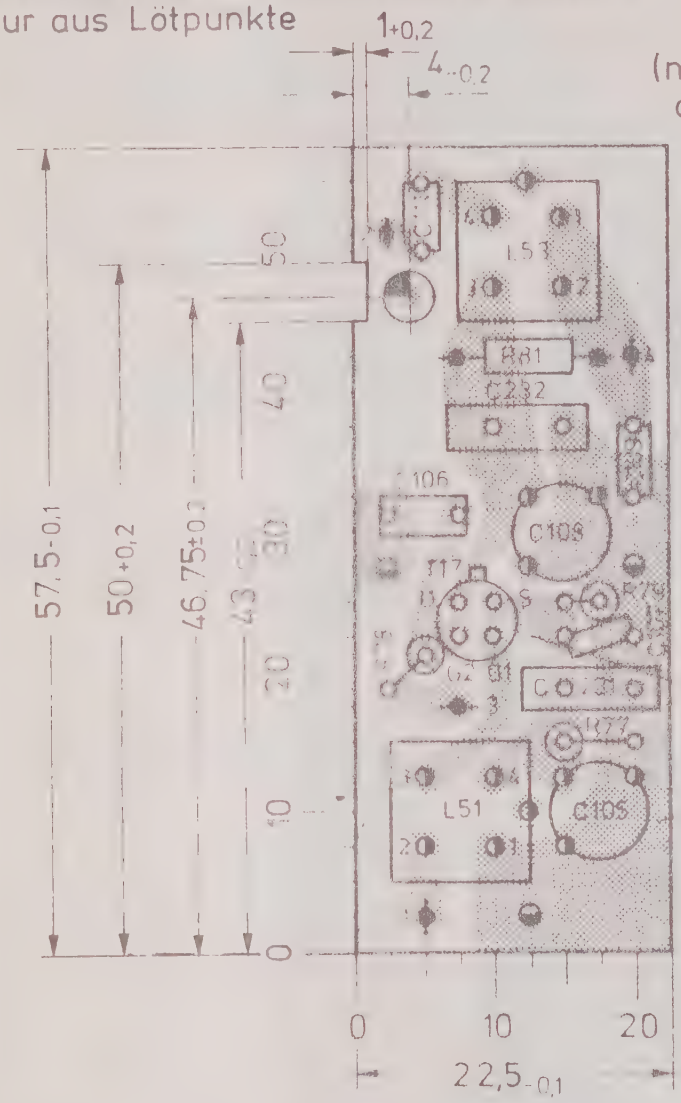
Platte

Z

Darstellung Bauteilseite
Leitungsfuhrung Leiterseite
Kaschierung der Bauteilseite besteht nur aus Lötpunkte

durchplattiert
hierzu 204.1784 DV1 Leiters.
204.1784 DV4 Bauteils.

tauchgelötet nach HVN 230
(nur als Film vorhanden, abgeleitet aus 203.8404 DV1, DV4



- VL 082 5253 (6 Stück)
- Schlitzrichtung d. Lötfahne

Für R77, R78 u. R79 max. Einbauhöhe 9 mm

Alle Bauteile außer T17 auf der Platte aufliegend

AZ 014.8921

204.1784 ohne eigene Zeichnung

Raster 2,5 (1,25), Toleranz beliebiger Teilungen zueinander ±0,05

- ⌀ 0,85 +0,1
- ⌀ 1,3 ±0,05
- ⌀ 1,8 +0,1
- ⌀ 4 +0,2

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff: 1,6 EP HGW 2X CU WS 002 3559			Untolerierte Maße	Zeichn. Nr.: 204.1778	
						Maßstab: 2:1	203 6018V	204.1749
	Datum	Name	Änd zust	Änd. Mitteilung Nr.	Datum	Name		Ersatz f. Zeichn.
gezeichnet	14.6.73	Schim						
bearbeitet	06.73	SL						
geprüft								
normgepr.								
							Platin	Z

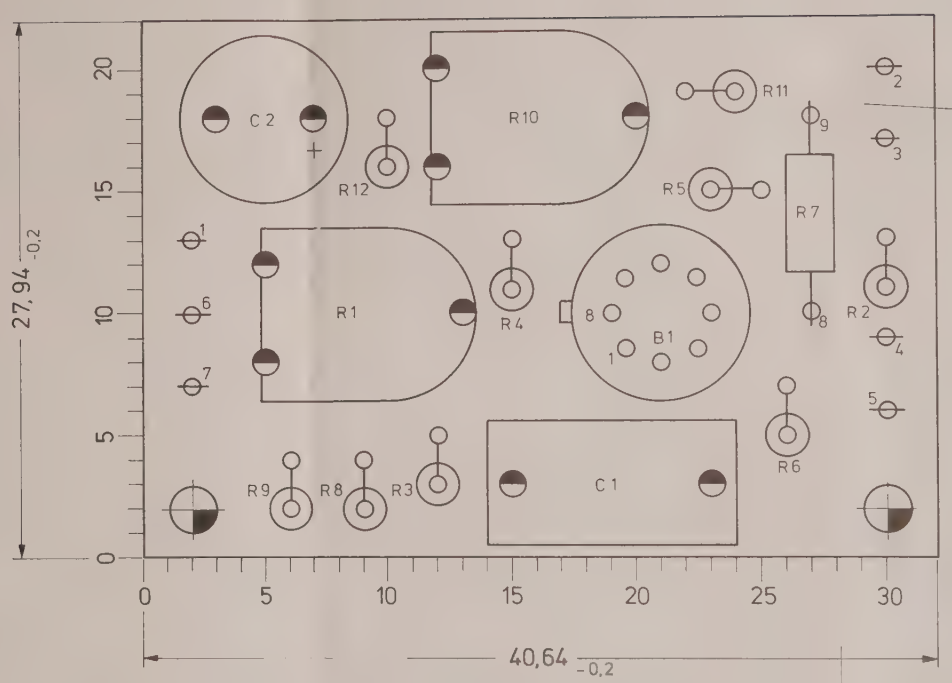
Darstellung Bauteilseite

durchplattiert

hierzu 204.2322 DV1 Leiters. Film
204.2322 DV4 Bauteils. Film
204.2322 DV5 Bohr Film
204.2322 L

tauchgelötet nach HVN 230

R7 nach dem Tauchlöten handgelötet

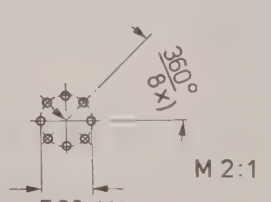


204.2322
ohne eigene Zeichnung

⊖ VL 082.5253 (9 Stück)
⊖ Schlitzrichtung der Stecklötöse

max. Bauhöhe auf der Bauteilseite 13 mm

max. Lötpunkthöhe 1,8 mm



Raster x 1,27 ; Toleranz beliebiger Teilungen zueinander ± 0,05
x) ± 30'

⊘ 0,85 +0,1
⊘ 1,3 +0,1
⊘ 2,4 +0,2

Zeichnung besteht aus 2 Blatt Blatt-Nr. 1

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff: 1,6 EP-HGW 2xCU WS 002 3559				Untolerierte Maße	Zeichn. Nr. 204.2316	
							Maßstab 4:1 (2:1)	203 6018 V	204 2300
1 EMU	Datum	Name	Änd. zust.	Änd. Mittg. Nr.	Datum	Name		Ersatz f. Zeichn.	
gezeichnet	4.2.74	Pt					AFC-Platine		Z
bearbeitet		NL							
geprüft									
normgepr.									

ISO-Projektion, Methode E

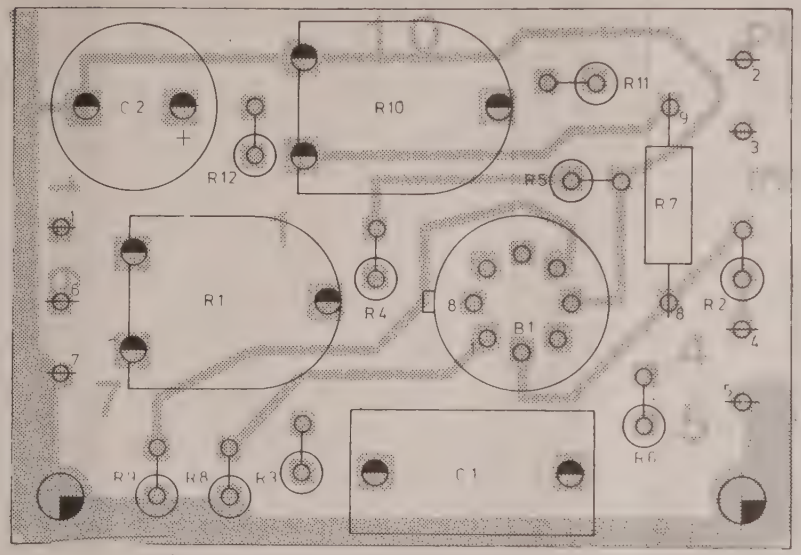
Vervielfält.-Pause Nr.

Arbeitspause Nr.

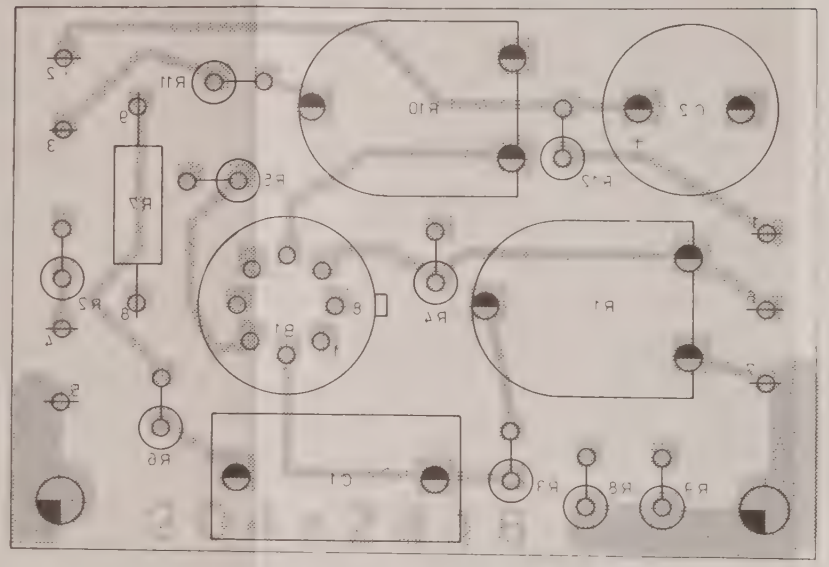
Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

NO 11.67.

Ansicht und Leitungsführung Bauteilseite
View of components side with tracks



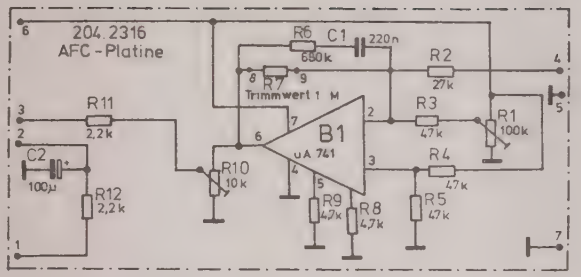
Ansicht und Leitungsführung Leiterseite
View of printed side with tracks



0 1 2 3
ZENTIMETER

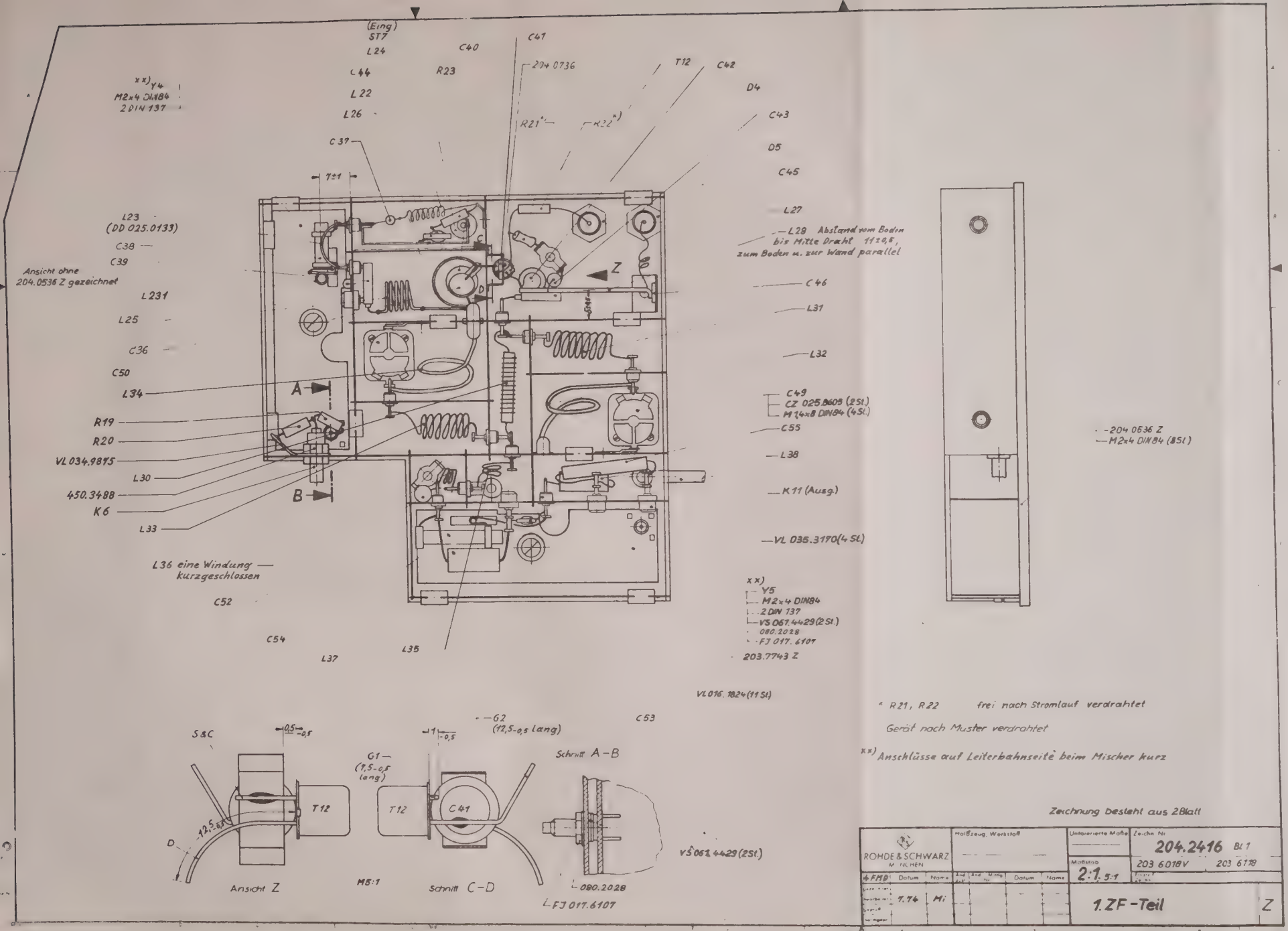
Blatt-Nr. 2

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff			Untolerierte Maße	Zeichn. Nr. 204. 2316
						Maßstab 2 1	203.6018 V / 204.2300
1EMU	Datum	Name	Änd. Nr.	Änd. Mittlg. Nr.	Datum Name		Ersatz f. Zeichn.
gezeichnet	4. 2. 74	Pt.				AFC-Platine	Z
bearbeitet		NL					
geprüft							
normgepr.							



Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ISO Projektion, Methode E	ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff				Untolerierte Maße	Zeichn. Nr. 204.2316 S
Vervielfält. Pause Nr.								Maßstab	203.6018.07V | 204.2300
Arbeitspause Nr.	1EMU	Datum	Name	Änd. Zust.	Änd. Mitteilg. Nr.	Datum	Name		Ersatz f. / Ers. d.
	gezeichnet	12.2.74	Hg	A	–	4.3.74	SL	AFC - Platine	
	bearbeitet								
	geprüft								
	normgepr.								

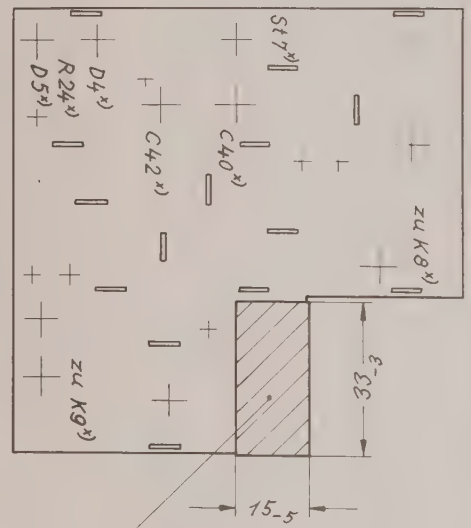


Zeichnung besteht aus 2 Blatt

ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff				Unterlegte Maße		Zeichn. Nr.	204.2416	Bl. 1
									Maßstab	2:1 5:1	203 6018V 203 6178
FMD	Datum	Name	Änd.	Änd. Nr.	Urspr.	Datum	Name				
	7.74	Mi							1. ZF-Teil		Z

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Rückansicht



Scotch-Teflon-Klebeband

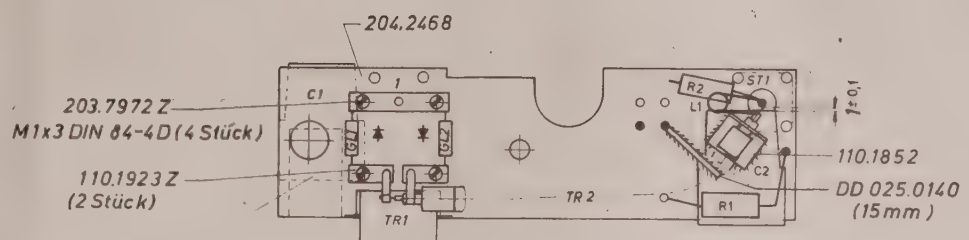
x) Warlungsbeschriftung 204.0542 aufgeklebt

Änd. zust.	Änd.-Mittlg. Nr.	Datum	Name	Halbzeug, Werkstoff	Maßstab 1:1	Untol. Maße
				—	Benennung 1. ZF-Teil	Z
					Zeichnung besteht aus . Blatt	Blatt-Nr. 2
				registr. in Verz. 203.6018 V	erste Z. 203.6118	Zeichn. Nr. 204.2416
ROHDE & SCHWARZ MÜNCHEN				Stelle 1EMB	gez. Datum	bearb. Datum 6.74 Mi / geprüft Datum / Ordn.-Nr. (nur für K-Ordner)

Isp. Proj. Meth. E

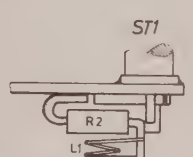
PF 095 0178

Bei TR1 Drahtenden so kurz wie möglich angelötet



C1 und 110.1869 auf Leiterseite

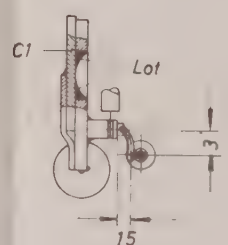
TR1 mit HHL 501 festgelegt



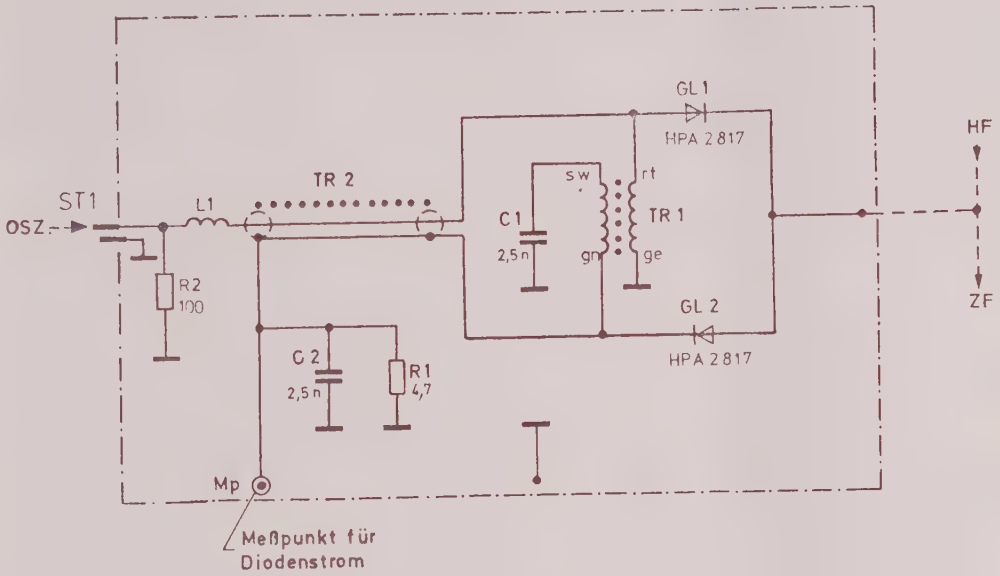
Anschlußschema TR1
(vereinfacht)

gelötet nach HVM 230;
niederschmelzendes Lot und Speziallötkolben mit niederer Temperatur (max. 155 °C) verwenden.
Beläge von C1 und C2 nicht mit Lötkolben verletzen.

Massestifte von ST1 abgezwickt



ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff				Untolerierte Maße ± 0,3	Zeichn. Nr. 204.2451	
4FM2U	Datum	Name	Änd. zust.	Änd. Mittlg Nr	Datum	Name	Maßstab 2:1	203.6018 V	203.7737
gezeichnet	07.74	NL						Ersatz f. Zeichn.	
bearbeitet							Mischer		Z
geprüft									
normgepr.									



Die Eintragung der elektrischen Werte von Bauelementen ist unverbindlich. Genaue Werte siehe Schaltteilliste.

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ISO-Projektion, Methode E

Vervielfält.-Pause

Arbeitspause Nr.

ROHDE & SCHWARZ
MÜNCHEN

Halbzeug, Werkstoff

Unotolerierte Maße

Maßstab

Zeichn. Nr. 204.2451 S

203.6018 V | 203.7737

Ersatz f. Zeichn.

4FMU	Datum	Name	Änd zust	Änd Mittlg Nr	Datum	Name
gezeichnet	2.8.74	Schim				
bearbeitet		Ne				
geprüft						
normgepr						

Stromlauf zu

Mischer

Z

THIS SECTION IN GERMAN LANGUAGE